TrigonometryExercise4 Answers for No.9594

$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(75^{o}) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) & .2 = \left(\mathrm{Sin}\left(\frac{\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .3 = (\mathrm{Tan}(105^{o}) = -2 - \sqrt{3}) & .4 = \left(\mathrm{Sin}((-285)^{o}) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .5 = \left(\mathrm{Cot}\left(\frac{13\pi}{12}\right) = 2 + \sqrt{3}\right) & .6 = \left(\mathrm{Csc}\left(-\frac{13\pi}{12}\right) = \sqrt{2}\sqrt{3} + \sqrt{2}\right) \\ .7 = \left(\mathrm{Cos}((-345)^{o}) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) & .8 = \left(\mathrm{Tan}\left(\frac{17\pi}{12}\right) = 2 + \sqrt{3}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\mathrm{Sin}\left(\frac{\pi}{18}\right)\mathrm{Cos}\left(\frac{\pi}{9}\right) + \mathrm{Cos}\left(\frac{\pi}{18}\right)\mathrm{Sin}\left(\frac{\pi}{9}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) & .2 = \left(\mathrm{Cos}(48^{o})\,\mathrm{Cos}(12^{o}) - \mathrm{Sin}(48^{o})\,\mathrm{Sin}(12^{o}) = \left(\mathrm{Cos}(60^{o}) = \frac{1}{2}\right)\right) \\ .3 = \left(1 - 2\,\mathrm{Sin}\left(\frac{\pi}{12}\right)^{2} = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) & .4 = \left(\mathrm{Cos}(22.5^{o})^{2} - \mathrm{Sin}(22.5^{o})^{2} = \left(\mathrm{Cos}(45^{o}) = \frac{\sqrt{2}}{2}\right)\right) \\ .5 = \left(\mathrm{Sin}\left(\frac{11\pi}{36}\right)\mathrm{Cos}\left(\frac{\pi}{18}\right) - \mathrm{Cos}\left(\frac{11\pi}{36}\right)\mathrm{Sin}\left(\frac{\pi}{18}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .6 = \left(\frac{2\,\mathrm{Tan}(22.5^{o})}{1 - \mathrm{Tan}(22.5^{o})^{2}} = (\mathrm{Tan}(45^{o}) = 1)\right) \\ .7 = \left(\frac{\mathrm{Tan}(12^{o}) + \mathrm{Tan}(33^{o})}{1 - \mathrm{Tan}(12^{o})\,\mathrm{Tan}(33^{o})} = (\mathrm{Tan}(45^{o}) = 1)\right) & .8 = \left(2\,\mathrm{Sin}\left(\frac{\pi}{8}\right)\mathrm{Cos}\left(\frac{\pi}{8}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .9 = \left(\frac{\mathrm{Tan}\left(\frac{7\pi}{30}\right) - \mathrm{Tan}\left(\frac{\pi}{15}\right)}{1 + \mathrm{Tan}\left(\frac{7\pi}{30}\right)\mathrm{Tan}\left(\frac{\pi}{15}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{3}\right)\right) & .10 = \left(2\,\mathrm{Cos}(15^{o})^{2} - 1 = \left(\mathrm{Cos}(30^{o}) = \frac{\sqrt{3}}{2}\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{2\sqrt{2}}{3}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{\sqrt{35}}{6}\right) \\ .3 = (\mathrm{Tan}(\alpha) = 2\sqrt{2}) & .4 = \left(\mathrm{Sin}(\beta - \alpha) = -\frac{1}{18} + \frac{\sqrt{2}\sqrt{35}}{9}\right) \\ .5 = \left(\mathrm{Cos}(\alpha - \beta) = -\frac{\sqrt{35}}{18} - \frac{\sqrt{2}}{9}\right) & .6 = \left(\mathrm{Tan}(\alpha + \beta) = \frac{8\sqrt{2}}{3} + \frac{\sqrt{35}}{3}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{17}{18}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = -\frac{4\sqrt{2}}{7}\right) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = -\frac{\sqrt{35}}{6}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{\sqrt{15}}{4}\right) \\ .3 = (\mathrm{Tan}(\alpha) = -\sqrt{35}) & .4 = \left(\mathrm{Sin}(\alpha + \beta) = \frac{\sqrt{35}\sqrt{15}}{24} + \frac{1}{24}\right) \\ .5 = \left(\mathrm{Cos}(\alpha - \beta) = -\frac{\sqrt{15}}{24} - \frac{\sqrt{35}}{24}\right) & .6 = \left(\mathrm{Tan}(\beta - \alpha) = \frac{9\sqrt{5}\sqrt{3}}{5} - \frac{4\sqrt{5}\sqrt{7}}{5}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = -\frac{\sqrt{15}}{8}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = \frac{\sqrt{35}}{17}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Cos}(3^{o}) = (\mathrm{Sqrt}(0.9975) = 0.999)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Sin}(21^{o}) = (\mathrm{Sqrt}(0.1285) = 0.358)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Cos}\left(\frac{5\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) & .2 = \left(\mathrm{Sin}(15^o) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .3 = \left(\mathrm{Tan}\left(\frac{7\pi}{12}\right) = -2 - \sqrt{3}\right) & .4 = (\mathrm{Tan}(255^o) = 2 + \sqrt{3}) \\ .5 = \left(\mathrm{Cot}\left(-\frac{\pi}{12}\right) = -2 - \sqrt{3}\right) & .6 = \left(\mathrm{Cos}\left(-\frac{13\pi}{12}\right) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .7 = (\mathrm{Csc}((\text{-}255)^o) = -\sqrt{2} + \sqrt{2}\sqrt{3}) & .8 = \left(\mathrm{Sin}\left(-\frac{23\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\frac{\mathrm{Tan}(65^o) - \mathrm{Tan}(20^o)}{1 + \mathrm{Tan}(65^o)\,\mathrm{Tan}(20^o)} = (\mathrm{Tan}(45^o) = 1)\right) & .2 = \left(\mathrm{Sin}(5^o)\,\mathrm{Cos}(25^o) + \mathrm{Cos}(5^o)\,\mathrm{Sin}(25^o) = \left(\mathrm{Sin}(30^o) = \frac{1}{2}\right)\right) \\ .3 = \left(\frac{2\,\mathrm{Tan}(15^o)}{1 - \mathrm{Tan}(15^o)^2} = \left(\mathrm{Tan}(30^o) = \frac{\sqrt{3}}{3}\right)\right) & .4 = \left(2\,\mathrm{Cos}(22.5^o)^2 - 1 = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .5 = \left(2\,\mathrm{Sin}\left(\frac{\pi}{12}\right)\mathrm{Cos}\left(\frac{\pi}{12}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) & .6 = \left(\mathrm{Cos}\left(\frac{4\pi}{9}\right)\mathrm{Cos}\left(\frac{\pi}{9}\right) + \mathrm{Sin}\left(\frac{4\pi}{9}\right)\mathrm{Sin}\left(\frac{\pi}{9}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{3}\right) = \frac{1}{2}\right)\right) \\ .7 = \left(1 - 2\,\mathrm{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .8 = \left(\mathrm{Sin}\left(\frac{17\pi}{30}\right)\mathrm{Cos}\left(\frac{\pi}{15}\right) - \mathrm{Cos}\left(\frac{17\pi}{30}\right)\mathrm{Sin}\left(\frac{\pi}{15}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{2}\right) = 1\right)\right) \\ .9 = \left(\mathrm{Cos}(15^o)^2 - \mathrm{Sin}(15^o)^2 = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) & .10 = \left(\frac{\mathrm{Tan}(12^o) + \mathrm{Tan}(33^o)}{1 - \mathrm{Tan}(12^o)\,\mathrm{Tan}(33^o)} = (\mathrm{Tan}(45^o) = 1)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{\sqrt{3}}{2}\right) & .2 = \left(\mathrm{Sin}(\beta) = \frac{2\sqrt{6}}{5}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = \frac{\sqrt{3}}{3}\right) & .4 = \left(\mathrm{Sin}(\beta - \alpha) = \frac{\sqrt{3}\sqrt{6}}{5} + \frac{1}{10}\right) \\ .5 = \left(\mathrm{Cos}(\alpha + \beta) = -\frac{\sqrt{3}}{10} - \frac{\sqrt{6}}{5}\right) & .6 = \left(\mathrm{Tan}(\alpha - \beta) = -\frac{25\sqrt{3}}{21} - \frac{8\sqrt{2}\sqrt{3}}{21}\right) \\ .7 = \left(\mathrm{Cos}(2\alpha) = \frac{1}{2}\right) & .8 = \left(\mathrm{Tan}(2\beta) = \frac{4\sqrt{6}}{23}\right) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = -\frac{\sqrt{65}}{9}\right) & .2 = \left(\mathrm{Cos}(\beta) = \frac{\sqrt{3}}{2}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = \frac{\sqrt{65}}{4}\right) & .4 = \left(\mathrm{Sin}(\alpha - \beta) = -\frac{\sqrt{65}\sqrt{3}}{18} - \frac{2}{9}\right) \\ .5 = \left(\mathrm{Cos}(\beta - \alpha) = -\frac{2\sqrt{3}}{9} + \frac{\sqrt{65}}{18}\right) & .6 = \left(\mathrm{Tan}(\alpha + \beta) = -\frac{16\sqrt{65}}{17} + \frac{81\sqrt{3}}{17}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = -\frac{\sqrt{3}}{2}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = -\frac{8\sqrt{65}}{49}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Sin}(26^o) = (\mathrm{Sqrt}(0.1920) = 0.438)), \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Cos}(11^o) = (\mathrm{Sqrt}(0.9635) = 0.982)), \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(75^o) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) & .2 = \left(\mathrm{Sin}\left(\frac{7\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = (\mathrm{Tan}(15^o) = 2 - \sqrt{3}) & .4 = (\mathrm{Sec}((-75)^o) = \sqrt{2}\sqrt{3} + \sqrt{2}) \\ .5 = \left(\mathrm{Cos}\left(-\frac{17\pi}{12}\right) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .6 = \left(\mathrm{Csc}\left(-\frac{7\pi}{12}\right) = -\sqrt{2}\sqrt{3} + \sqrt{2}\right) \\ .7 = (\mathrm{Cot}(195^o) = 2 + \sqrt{3}) & .8 = \left(\mathrm{Sin}((-285)^o) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = (\mathrm{Sin}(100^o)\,\mathrm{Cos}(10^o) - \mathrm{Cos}(100^o)\,\mathrm{Sin}(10^o) = (\mathrm{Sin}(90^o) = 1)) & .2 = \left(2\,\mathrm{Cos}\left(\frac{\pi}{8}\right)^2 - 1 = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .3 = \left(\frac{2\,\mathrm{Tan}\left(\frac{\pi}{8}\right)}{1 - \mathrm{Tan}\left(\frac{\pi}{8}\right)^2} = \left(\mathrm{Tan}\left(\frac{\pi}{4}\right) = \mathrm{Tan}\left(\frac{\pi}{4}\right)\right)\right) & .4 = \left(\mathrm{Cos}\left(\frac{\pi}{12}\right)^2 - \mathrm{Sin}\left(\frac{\pi}{12}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .5 = \left(\mathrm{Sin}(50^o)\,\mathrm{Cos}(10^o) + \mathrm{Cos}(50^o)\,\mathrm{Sin}(10^o) = \left(\mathrm{Sin}(60^o) = \frac{\sqrt{3}}{2}\right)\right) & .6 = \left(\mathrm{Cos}\left(\frac{13\pi}{30}\right)\mathrm{Cos}\left(\frac{\pi}{15}\right) - \mathrm{Sin}\left(\frac{13\pi}{30}\right)\mathrm{Sin}\left(\frac{\pi}{15}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{2}\right) = 0\right)\right) \\ .7 = \left(\frac{\mathrm{Tan}(60^o) - \mathrm{Tan}(15^o)}{1 + \mathrm{Tan}(60^o)\,\mathrm{Tan}(15^o)} = (\mathrm{Tan}(45^o) = 1)\right) & .8 = \left(\frac{\mathrm{Tan}\left(\frac{5\pi}{36}\right) + \mathrm{Tan}\left(\frac{\pi}{36}\right)}{1 - \mathrm{Tan}\left(\frac{5\pi}{36}\right)\mathrm{Tan}\left(\frac{\pi}{36}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{3}\right)\right) \\ .9 = \left(1 - 2\,\mathrm{Sin}(22.5^o)^2 = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .10 = \left(2\,\mathrm{Sin}(15^o)\,\mathrm{Cos}(15^o) = \left(\mathrm{Sin}(30^o) = \frac{1}{2}\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \left[\left[\begin{matrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{matrix}\right]\right] \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{\sqrt{3}}{2}\right) & .2 = \left(\mathrm{Sin}(\beta) = -\frac{2\sqrt{14}}{9}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = \frac{\sqrt{3}}{3}\right) & .4 = \left(\mathrm{Sin}(\alpha+\beta) = -\frac{\sqrt{3}\sqrt{14}}{9} + \frac{5}{18}\right) \\ .5 = \left(\mathrm{Cos}(\beta-\alpha) = \frac{5\sqrt{3}}{18} - \frac{\sqrt{14}}{9}\right) & .6 = \left(\mathrm{Tan}(\alpha-\beta) = \frac{81\sqrt{3}}{19} + \frac{40\sqrt{14}}{19}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{-31}{81}\right) & .8 = (\mathrm{Tan}(2\alpha) = \sqrt{3}) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = -\frac{\sqrt{33}}{7}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{\sqrt{21}}{5}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = \frac{\sqrt{33}}{4}\right) & .4 = \left(\mathrm{Sin}(\alpha-\beta) = \frac{\sqrt{33}\sqrt{21}}{35} + \frac{8}{35}\right) \\ .5 = \left(\mathrm{Cos}(\alpha+\beta) = \frac{4\sqrt{21}}{35} + \frac{2\sqrt{33}}{35}\right) & .6 = \left(\mathrm{Tan}(\beta-\alpha) = -\frac{49\sqrt{7}\sqrt{3}}{102} - \frac{25\sqrt{3}\sqrt{11}}{51}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = -\frac{4\sqrt{21}}{25}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = -\frac{8\sqrt{33}}{17}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Sin}(4^o) = (\mathrm{Sqrt}(0.0050) = 0.070)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Cos}(37^o) = (\mathrm{Sqrt}(0.6380) = 0.799)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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TrigonometryExercise4 Answers for No.9649

$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(105^o) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\mathrm{Cos}\left(\frac{5\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .3 = \left(\mathrm{Tan}\left(\frac{\pi}{12}\right) = 2 - \sqrt{3}\right) & .4 = \left(\mathrm{Cot}\left(\frac{19\pi}{12}\right) = -2 + \sqrt{3}\right) \\ .5 = \left(\mathrm{Csc}(165^o) = \sqrt{2}\sqrt{3} + \sqrt{2}\right) & .6 = \left(\mathrm{Cos}\left(-\frac{\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .7 = \left(\mathrm{Sec}((\text{-}195)^o) = -\sqrt{2}\sqrt{3} + \sqrt{2}\right) & .8 = \left(\mathrm{Sin}((\text{-}165)^o) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\frac{\mathrm{Tan}\left(\frac{17\pi}{36}\right) - \mathrm{Tan}\left(\frac{5\pi}{36}\right)}{1 + \mathrm{Tan}\left(\frac{17\pi}{36}\right)\mathrm{Tan}\left(\frac{5\pi}{36}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{3}\right) = \sqrt{3}\right)\right) & .2 = \left(\left(1 - 2\,\mathrm{Sin}\left(\frac{\pi}{12}\right)^2\right) = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .3 = \left(2\,\mathrm{Sin}\left(\frac{\pi}{8}\right)\mathrm{Cos}\left(\frac{\pi}{8}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .4 = \left(\mathrm{Cos}\left(\frac{\pi}{15}\right)\mathrm{Cos}\left(\frac{4\pi}{15}\right) - \mathrm{Sin}\left(\frac{\pi}{15}\right)\mathrm{Sin}\left(\frac{4\pi}{15}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{3}\right) = \frac{1}{2}\right)\right) \\ .5 = \left(2\,\mathrm{Cos}(15^o)^2 - 1 = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) & .6 = \left(\frac{2\,\mathrm{Tan}\left(\frac{\pi}{12}\right)}{1 - \mathrm{Tan}\left(\frac{\pi}{12}\right)^2} = \left(\mathrm{Tan}\left(\frac{\pi}{6}\right) = \mathrm{Tan}\left(\frac{\pi}{6}\right)\right)\right) \\ .7 = \left(\frac{\mathrm{Tan}\left(\frac{\pi}{9}\right) + \mathrm{Tan}\left(\frac{\pi}{18}\right)}{1 - \mathrm{Tan}\left(\frac{\pi}{9}\right)\mathrm{Tan}\left(\frac{\pi}{18}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{3}\right)\right) & .8 = \left(\mathrm{Cos}(65^o)\,\mathrm{Cos}(20^o) + \mathrm{Sin}(65^o)\,\mathrm{Sin}(20^o) = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .9 = \left(\mathrm{Cos}(22.5^o)^2 - \mathrm{Sin}(22.5^o)^2 = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .10 = \left(\mathrm{Sin}(35^o)\,\mathrm{Cos}(5^o) - \mathrm{Cos}(35^o)\,\mathrm{Sin}(5^o) = \left(\mathrm{Sin}(30^o) = \frac{1}{2}\right)\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{3}{5}\right) & .2 = \left(\mathrm{Sin}(\beta) = -\frac{\sqrt{3}}{2}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = \sqrt{3}\right) & .4 = \left(\mathrm{Sin}(\alpha - \beta) = -\frac{2}{5} + \frac{3\sqrt{3}}{10}\right) \\ .5 = \left(\mathrm{Cos}(\alpha + \beta) = -\frac{3}{10} + \frac{2\sqrt{3}}{5}\right) & .6 = \left(\mathrm{Tan}(\beta - \alpha) = -\frac{25\sqrt{3}}{39} + \frac{16}{13}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = \frac{\sqrt{3}}{2}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = \frac{\text{-}24}{7}\right) \end{bmatrix}, \quad , \; Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{2\sqrt{10}}{7}\right) & .2 = \left(\mathrm{Sin}(\beta) = \frac{2\sqrt{6}}{5}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = -\frac{3\sqrt{10}}{20}\right) & .4 = \left(\mathrm{Sin}(\beta - \alpha) = \frac{4\sqrt{10}\sqrt{6}}{35} - \frac{3}{35}\right) \\ .5 = \left(\mathrm{Cos}(\alpha - \beta) = -\frac{2\sqrt{10}}{35} - \frac{6\sqrt{6}}{35}\right) & .6 = \left(\mathrm{Tan}(\alpha + \beta) = \frac{75\sqrt{2}\sqrt{5}}{88} + \frac{49\sqrt{2}\sqrt{3}}{88}\right) \\ .7 = \left(\mathrm{Sin}(2\alpha) = -\frac{12\sqrt{10}}{49}\right) & .8 = \left(\mathrm{Tan}(2\beta) = \frac{4\sqrt{6}}{23}\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Sin}(4^o) = (\mathrm{Sqrt}(0.0050) = 0.070)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Cos}(34^o) = (\mathrm{Sqrt}(0.6875) = 0.829)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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$$Ans1 = \begin{bmatrix} .1 = \left(\text{Cos}(105^o) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\text{Sin}\left(\frac{\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .3 = (\text{Tan}(75^o) = 2 + \sqrt{3}) & .4 = \left(\text{Cot}\left(\frac{17\pi}{12}\right) = 2 - \sqrt{3}\right) \\ .5 = (\text{Tan}(345^o) = -2 + \sqrt{3}) & .6 = \left(\text{Cos}\left(\frac{19\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .7 = \left(\text{Sin}((-255)^o) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) & .8 = \left(\text{Csc}\left(-\frac{\pi}{12}\right) = -\sqrt{2} - \sqrt{2}\sqrt{3}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\text{Cos}\left(\frac{\pi}{8}\right)^2 - \text{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\text{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .2 = \left(2\,\text{Cos}\left(\frac{\pi}{12}\right)^2 - 1 = \left(\text{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .3 = \left(\text{Cos}\left(\frac{13\pi}{30}\right)\text{Cos}\left(\frac{\pi}{15}\right) - \text{Sin}\left(\frac{13\pi}{30}\right)\text{Sin}\left(\frac{\pi}{15}\right) = \left(\text{Cos}\left(\frac{\pi}{2}\right) = 0\right)\right) & .4 = \left(\frac{\text{Tan}(20^o) + \text{Tan}(40^o)}{1 - \text{Tan}(20^o)\,\text{Tan}(40^o)} = (\text{Tan}(60^o) = \sqrt{3})\right) \\ .5 = \left(\frac{2\,\text{Tan}\left(\frac{\pi}{12}\right)}{1 - \text{Tan}\left(\frac{\pi}{12}\right)^2} = \left(\text{Tan}\left(\frac{\pi}{6}\right) = \text{Tan}\left(\frac{\pi}{6}\right)\right)\right) & .6 = \left(\text{Sin}(35^o)\,\text{Cos}(10^o) + \text{Cos}(35^o)\,\text{Sin}(10^o) = \left(\text{Sin}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .7 = \left(\frac{\text{Tan}(70^o) - \text{Tan}(10^o)}{1 + \text{Tan}(70^o)\,\text{Tan}(10^o)} = (\text{Tan}(60^o) = \sqrt{3})\right) & .8 = \left(\text{Sin}\left(\frac{5\pi}{18}\right)\text{Cos}\left(\frac{\pi}{9}\right) - \text{Cos}\left(\frac{5\pi}{18}\right)\text{Sin}\left(\frac{\pi}{9}\right) = \left(\text{Sin}\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) \\ .9 = \left((1 - 2\,\text{Sin}(15^o))^2 = \left(\text{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) & .10 = \left(2\,\text{Sin}(22.5^o)\,\text{Cos}(22.5^o) = \left(\text{Sin}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \left[\left[\begin{matrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{matrix}\right]\right] \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\text{Cos}(\alpha) = \frac{\sqrt{39}}{8}\right) & .2 = \left(\text{Sin}(\beta) = \frac{\sqrt{3}}{2}\right) \\ .3 = \left(\text{Tan}(\alpha) = \frac{5\sqrt{39}}{39}\right) & .4 = \left(\text{Sin}(\alpha - \beta) = -\frac{5}{16} - \frac{\sqrt{3}\sqrt{39}}{16}\right) \\ .5 = \left(\text{Cos}(\beta - \alpha) = -\frac{\sqrt{39}}{16} + \frac{5\sqrt{3}}{16}\right) & .6 = \left(\text{Tan}(\alpha + \beta) = -\frac{5\sqrt{3}\sqrt{13}}{9} + \frac{16\sqrt{3}}{9}\right) \\ .7 = \left(\text{Cos}(2\beta) = \frac{-1}{2}\right) & .8 = \left(\text{Tan}(2\alpha) = \frac{5\sqrt{39}}{7}\right) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\text{Sin}(\alpha) = -\frac{\sqrt{5}}{3}\right) & .2 = \left(\text{Cos}(\beta) = \frac{\sqrt{65}}{9}\right) \\ .3 = \left(\text{Tan}(\beta) = -\frac{4\sqrt{65}}{65}\right) & .4 = \left(\text{Sin}(\alpha - \beta) = -\frac{\sqrt{5}\sqrt{65}}{27} - \frac{8}{27}\right) \\ .5 = \left(\text{Cos}(\alpha + \beta) = -\frac{2\sqrt{65}}{27} - \frac{4\sqrt{5}}{27}\right) & .6 = \left(\text{Tan}(\beta - \alpha) = -\frac{\sqrt{13}\sqrt{5}}{5} - \frac{9\sqrt{5}}{10}\right) \\ .7 = \left(\text{Cos}(2\alpha) = \frac{-1}{9}\right) & .8 = \left(\text{Tan}(2\beta) = -\frac{8\sqrt{65}}{49}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\text{Sin}(36^o) = (\text{Sqrt}(0.3455) = 0.588)), \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\text{Cos}(6^o) = (\text{Sqrt}(0.9890) = 0.995)), \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Sin}\left(\frac{\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) & .2 = \left(\mathrm{Cos}(105^o) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = \left(\mathrm{Tan}\left(\frac{5\pi}{12}\right) = 2 + \sqrt{3}\right) & .4 = \left(\mathrm{Cot}\left(-\frac{17\pi}{12}\right) = -2 + \sqrt{3}\right) \\ .5 = (\mathrm{Csc}((-15)^o) = -\sqrt{2} - \sqrt{2}\sqrt{3}) & .6 = \left(\mathrm{Sec}\left(-\frac{13\pi}{12}\right) = -\sqrt{2}\sqrt{3} + \sqrt{2}\right) \\ .7 = (\mathrm{Tan}((-105)^o) = 2 + \sqrt{3}) & .8 = \left(\mathrm{Sin}\left(-\frac{5\pi}{12}\right) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \end{bmatrix}, \; , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\frac{\mathrm{Tan}\left(\frac{\pi}{9}\right) + \mathrm{Tan}\left(\frac{\pi}{18}\right)}{1 - \mathrm{Tan}\left(\frac{\pi}{9}\right)\mathrm{Tan}\left(\frac{\pi}{18}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{3}\right)\right) & .2 = \left(\mathrm{Sin}(20^o)\,\mathrm{Cos}(25^o) + \mathrm{Cos}(20^o)\,\mathrm{Sin}(25^o) = \left(\mathrm{Sin}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .3 = \left(2\,\mathrm{Sin}\left(\frac{\pi}{8}\right)\mathrm{Cos}\left(\frac{\pi}{8}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .4 = \left(\mathrm{Cos}(40^o)\,\mathrm{Cos}(10^o) + \mathrm{Sin}(40^o)\,\mathrm{Sin}(10^o) = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) \\ .5 = \left(\mathrm{Sin}(65^o)\,\mathrm{Cos}(20^o) - \mathrm{Cos}(65^o)\,\mathrm{Sin}(20^o) = \left(\mathrm{Sin}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .6 = \left(1 - 2\,\mathrm{Sin}(15^o)^2 = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) \\ .7 = \left(\frac{\mathrm{Tan}\left(\frac{7\pi}{18}\right) - \mathrm{Tan}\left(\frac{\pi}{18}\right)}{1 + \mathrm{Tan}\left(\frac{7\pi}{18}\right)\mathrm{Tan}\left(\frac{\pi}{18}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{3}\right) = \sqrt{3}\right)\right) & .8 = \left(\mathrm{Cos}\left(\frac{\pi}{12}\right)^2 - \mathrm{Sin}\left(\frac{\pi}{12}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .9 = \left(2\,\mathrm{Cos}(22.5^o)^2 - 1 = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .10 = \left(\frac{2\,\mathrm{Tan}(15^o)}{1 - \mathrm{Tan}(15^o)^2} = \left(\mathrm{Tan}(30^o) = \frac{\sqrt{3}}{3}\right)\right) \end{bmatrix}, \; , \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{2\sqrt{6}}{5}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{2\sqrt{6}}{7}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = \frac{5\sqrt{6}}{12}\right) & .4 = \left(\mathrm{Sin}(\alpha+\beta) = \frac{-29}{35}\right) \\ .5 = \left(\mathrm{Cos}(\alpha-\beta) = -\frac{12\sqrt{6}}{35}\right) & .6 = \left(\mathrm{Tan}(\beta-\alpha) = -\frac{19\sqrt{6}}{72}\right) \\ .7 = \left(\mathrm{Sin}(2\alpha) = \frac{4\sqrt{6}}{25}\right) & .8 = (\mathrm{Tan}(2\beta) = -20\sqrt{6}) \end{bmatrix}, \; Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = -\frac{2\sqrt{2}}{3}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{\sqrt{39}}{8}\right) \\ .3 = (\mathrm{Tan}(\alpha) = -2\sqrt{2}) & .4 = \left(\mathrm{Sin}(\beta-\alpha) = \frac{5}{24} - \frac{\sqrt{2}\sqrt{39}}{12}\right) \\ .5 = \left(\mathrm{Cos}(\alpha+\beta) = -\frac{\sqrt{39}}{24} + \frac{5\sqrt{2}}{12}\right) & .6 = \left(\mathrm{Tan}(\alpha-\beta) = \frac{128\sqrt{2}}{161} - \frac{45\sqrt{39}}{161}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = -\frac{5\sqrt{39}}{32}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = \frac{4\sqrt{2}}{7}\right) \end{bmatrix}, \; , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Cos}(35^o) = (\mathrm{Sqrt}(0.6710) = 0.819)), \; , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Sin}(11^o) = (\mathrm{Sqrt}(0.0365) = 0.191)), \; , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans1 = \begin{bmatrix} .1 = \left(\operatorname{Cos}\left(\frac{\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\operatorname{Sin}(105^o) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = (\operatorname{Tan}(75^o) = 2 + \sqrt{3}) & .4 = \left(\operatorname{Sec}\left(-\frac{19\pi}{12}\right) = \sqrt{2}\sqrt{3} + \sqrt{2}\right) \\ .5 = (\operatorname{Tan}(345^o) = -2 + \sqrt{3}) & .6 = \left(\operatorname{Csc}\left(\frac{17\pi}{12}\right) = -\sqrt{2}\sqrt{3} + \sqrt{2}\right) \\ .7 = (\operatorname{Cot}(195^o) = 2 + \sqrt{3}) & .8 = \left(\operatorname{Cos}\left(\frac{19\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \end{bmatrix}, \; , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\operatorname{Sin}\left(\frac{\pi}{15}\right)\operatorname{Cos}\left(\frac{13\pi}{30}\right) + \operatorname{Cos}\left(\frac{\pi}{15}\right)\operatorname{Sin}\left(\frac{13\pi}{30}\right) = \left(\operatorname{Sin}\left(\frac{\pi}{2}\right) = 1\right)\right) & .2 = \left(\operatorname{Cos}\left(\frac{\pi}{8}\right)^2 - \operatorname{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\operatorname{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .3 = (\operatorname{Sin}(105^o)\operatorname{Cos}(15^o) - \operatorname{Cos}(105^o)\operatorname{Sin}(15^o) = (\operatorname{Sin}(90^o) = 1)) & .4 = \left(2\operatorname{Cos}(15^o)^2 - 1 = \left(\operatorname{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) \\ .5 = \left(\operatorname{Cos}(65^o)\operatorname{Cos}(20^o) + \operatorname{Sin}(65^o)\operatorname{Sin}(20^o) = \left(\operatorname{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .6 = \left(\operatorname{Cos}(15^o)\operatorname{Cos}(30^o) - \operatorname{Sin}(15^o)\operatorname{Sin}(30^o) = \left(\operatorname{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .7 = \left(2\operatorname{Sin}(22.5^o)\operatorname{Cos}(22.5^o) = \left(\operatorname{Sin}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .8 = \left(\frac{\operatorname{Tan}\left(\frac{7\pi}{30}\right) - \operatorname{Tan}\left(\frac{\pi}{15}\right)}{1 + \operatorname{Tan}\left(\frac{7\pi}{30}\right)\operatorname{Tan}\left(\frac{\pi}{15}\right)} = \left(\operatorname{Tan}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{3}\right)\right) \\ .9 = \left(\frac{2\operatorname{Tan}(15^o)}{1 - \operatorname{Tan}(15^o)^2} = \left(\operatorname{Tan}(30^o) = \frac{\sqrt{3}}{3}\right)\right) & .10 = \left(1 - 2\operatorname{Sin}\left(\frac{\pi}{12}\right)^2 = \left(\operatorname{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \end{bmatrix}, \; , \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\operatorname{Sin}(\alpha) = \frac{\sqrt{3}}{2}\right) & .2 = \left(\operatorname{Cos}(\beta) = \frac{\sqrt{7}}{4}\right) \\ .3 = (\operatorname{Tan}(\alpha) = \sqrt{3}) & .4 = \left(\operatorname{Sin}(\alpha - \beta) = \frac{\sqrt{7}\sqrt{3}}{8} + \frac{3}{8}\right) \\ .5 = \left(\operatorname{Cos}(\alpha + \beta) = \frac{\sqrt{7}}{8} + \frac{3\sqrt{3}}{8}\right) & .6 = \left(\operatorname{Tan}(\beta - \alpha) = \frac{3\sqrt{7}}{5} + \frac{4\sqrt{3}}{5}\right) \\ .7 = \left(\operatorname{Sin}(2\alpha) = \frac{\sqrt{3}}{2}\right) & .8 = (\operatorname{Tan}(2\beta) = 3\sqrt{7}) \end{bmatrix}, \; , \; Ans4 = \begin{bmatrix} .1 = \left(\operatorname{Cos}(\alpha) = -\frac{\sqrt{3}}{2}\right) & .2 = \left(\operatorname{Sin}(\beta) = \frac{\sqrt{7}}{4}\right) \\ .3 = \left(\operatorname{Tan}(\alpha) = \frac{\sqrt{3}}{3}\right) & .4 = \left(\operatorname{Sin}(\beta - \alpha) = -\frac{\sqrt{7}\sqrt{3}}{8} - \frac{3}{8}\right) \\ .5 = \left(\operatorname{Cos}(\alpha + \beta) = \frac{\sqrt{7}}{8} + \frac{3\sqrt{3}}{8}\right) & .6 = \left(\operatorname{Tan}(\alpha - \beta) = \frac{3\sqrt{7}}{5} + \frac{4\sqrt{3}}{5}\right) \\ .7 = \left(\operatorname{Sin}(2\beta) = -\frac{3\sqrt{7}}{8}\right) & .8 = (\operatorname{Tan}(2\alpha) = \sqrt{3}) \end{bmatrix}, \; , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\operatorname{Sin}(43^o) = (\operatorname{Sqrt}(0.4650) = 0.682)), \; , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\operatorname{Cos}(32^o) = (\operatorname{Sqrt}(0.7190) = 0.848)), \; , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(75^{o}) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) & .2 = \left(\mathrm{Sin}\left(\frac{7\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = (\mathrm{Tan}(15^{o}) = 2 - \sqrt{3}) & .4 = \left(\mathrm{Tan}\left(-\frac{19\pi}{12}\right) = 2 + \sqrt{3}\right) \\ .5 = \left(\mathrm{Sin}((-195)^{o}) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) & .6 = (\mathrm{Cot}((-165)^{o}) = 2 + \sqrt{3}) \\ .7 = \left(\mathrm{Sec}\left(-\frac{23\pi}{12}\right) = -\sqrt{2} + \sqrt{2}\sqrt{3}\right) & .8 = \left(\mathrm{Csc}\left(\frac{19\pi}{12}\right) = -\sqrt{2}\sqrt{3} + \sqrt{2}\right) \end{bmatrix}, \ , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\mathrm{Sin}\left(\frac{7\pi}{36}\right)\mathrm{Cos}\left(\frac{\pi}{18}\right) + \mathrm{Cos}\left(\frac{7\pi}{36}\right)\mathrm{Sin}\left(\frac{\pi}{18}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .2 = \left(\frac{\mathrm{Tan}\left(\frac{\pi}{3}\right) - \mathrm{Tan}\left(\frac{\pi}{12}\right)}{1 + \mathrm{Tan}\left(\frac{\pi}{3}\right)\mathrm{Tan}\left(\frac{\pi}{12}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{4}\right) = 1\right)\right) \\ .3 = \left(\mathrm{Sin}(72^{o})\,\mathrm{Cos}(12^{o}) - \mathrm{Cos}(72^{o})\,\mathrm{Sin}(12^{o}) = \left(\mathrm{Sin}(60^{o}) = \frac{\sqrt{3}}{2}\right)\right) & .4 = \left(2\,\mathrm{Sin}\left(\frac{\pi}{12}\right)\mathrm{Cos}\left(\frac{\pi}{12}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) \\ .5 = \left(2\,\mathrm{Cos}(22.5^{o})^{2} - 1 = \left(\mathrm{Cos}(45^{o}) = \frac{\sqrt{2}}{2}\right)\right) & .6 = \left(\frac{\mathrm{Tan}\left(\frac{4\pi}{15}\right) + \mathrm{Tan}\left(\frac{\pi}{15}\right)}{1 - \mathrm{Tan}\left(\frac{4\pi}{15}\right)\mathrm{Tan}\left(\frac{\pi}{15}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{3}\right) = \sqrt{3}\right)\right) \\ .7 = \left(\mathrm{Cos}(15^{o})^{2} - \mathrm{Sin}(15^{o})^{2} = \left(\mathrm{Cos}(30^{o}) = \frac{\sqrt{3}}{2}\right)\right) & .8 = \left(\mathrm{Cos}(40^{o})\,\mathrm{Cos}(10^{o}) + \mathrm{Sin}(40^{o})\,\mathrm{Sin}(10^{o}) = \left(\mathrm{Cos}(30^{o}) = \frac{\sqrt{3}}{2}\right)\right) \\ .9 = \left(\frac{2\,\mathrm{Tan}\left(\frac{\pi}{8}\right)}{1 - \mathrm{Tan}\left(\frac{\pi}{8}\right)^{2}} = \left(\mathrm{Tan}\left(\frac{\pi}{4}\right) = \mathrm{Tan}\left(\frac{\pi}{4}\right)\right)\right) & .10 = \left(1 - 2\,\mathrm{Sin}\left(\frac{\pi}{8}\right)^{2} = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \end{bmatrix}, \ , \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{2\sqrt{6}}{7}\right) & .2 = \left(\mathrm{Sin}(\beta) = -\frac{\sqrt{55}}{8}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = -\frac{\sqrt{55}}{3}\right) & .4 = \left(\mathrm{Sin}(\alpha - \beta) = \frac{15}{56} + \frac{\sqrt{6}\sqrt{55}}{28}\right) \\ .5 = \left(\mathrm{Cos}(\beta - \alpha) = \frac{3\sqrt{6}}{28} - \frac{5\sqrt{55}}{56}\right) & .6 = \left(\mathrm{Tan}(\alpha + \beta) = -\frac{640\sqrt{6}}{1159} + \frac{147\sqrt{55}}{1159}\right) \\ .7 = \left(\mathrm{Cos}(2\alpha) = \frac{-1}{49}\right) & .8 = \left(\mathrm{Tan}(2\beta) = \frac{3\sqrt{55}}{23}\right) \end{bmatrix}, \ , Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{\sqrt{21}}{5}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{\sqrt{35}}{6}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = \frac{\sqrt{35}}{35}\right) & .4 = \left(\mathrm{Sin}(\alpha - \beta) = -\frac{\sqrt{21}\sqrt{35}}{30} - \frac{1}{15}\right) \\ .5 = \left(\mathrm{Cos}(\alpha + \beta) = \frac{\sqrt{35}}{15} + \frac{\sqrt{21}}{30}\right) & .6 = \left(\mathrm{Tan}(\beta - \alpha) = \frac{25\sqrt{5}\sqrt{7}}{119} + \frac{72\sqrt{7}\sqrt{3}}{119}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = \frac{\sqrt{35}}{18}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = \frac{4\sqrt{21}}{17}\right) \end{bmatrix}, \ , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Sin}(28^{o}) = (\mathrm{Sqrt}(0.2205) = 0.469)), \ , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Cos}(16^{o}) = (\mathrm{Sqrt}(0.9240) = 0.961)), \ , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Cos}\left(\frac{5\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) & .2 = \left(\mathrm{Sin}(105^o) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = \left(\mathrm{Tan}\left(\frac{\pi}{12}\right) = 2 - \sqrt{3}\right) & .4 = \left(\mathrm{Cot}((-345)^o) = 2 + \sqrt{3}\right) \\ .5 = \left(\mathrm{Tan}\left(\frac{19\pi}{12}\right) = -2 - \sqrt{3}\right) & .6 = \left(\mathrm{Cos}((-75)^o) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .7 = \left(\mathrm{Csc}\left(\frac{11\pi}{12}\right) = \sqrt{2}\sqrt{3} + \sqrt{2}\right) & .8 = \left(\mathrm{Sec}(345^o) = -\sqrt{2} + \sqrt{2}\sqrt{3}\right) \end{bmatrix}, \quad , \begin{bmatrix} \underline{:)} \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ \underline{:)} \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(15^o)^2 - \mathrm{Sin}(15^o)^2 = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) & .2 = \left(\frac{\mathrm{Tan}\left(\frac{11\pi}{36}\right) - \mathrm{Tan}\left(\frac{\pi}{18}\right)}{1 + \mathrm{Tan}\left(\frac{11\pi}{36}\right)\mathrm{Tan}\left(\frac{\pi}{18}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{4}\right) = 1\right)\right) \\ .3 = \left(\mathrm{Cos}(35^o)\,\mathrm{Cos}(25^o) - \mathrm{Sin}(35^o)\,\mathrm{Sin}(25^o) = \left(\mathrm{Cos}(60^o) = \frac{1}{2}\right)\right) & .4 = \left(\frac{\mathrm{Tan}(20^o) + \mathrm{Tan}(25^o)}{1 - \mathrm{Tan}(20^o)\,\mathrm{Tan}(25^o)} = (\mathrm{Tan}(45^o) = 1)\right) \\ .5 = \left(1 - 2\,\mathrm{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .6 = \left(2\,\mathrm{Cos}\left(\frac{\pi}{12}\right)^2 - 1 = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .7 = \left(2\,\mathrm{Sin}(22.5^o)\,\mathrm{Cos}(22.5^o) = \left(\mathrm{Sin}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .8 = \left(\mathrm{Sin}\left(\frac{7\pi}{30}\right)\mathrm{Cos}\left(\frac{\pi}{15}\right) - \mathrm{Cos}\left(\frac{7\pi}{30}\right)\mathrm{Sin}\left(\frac{\pi}{15}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) \\ .9 = \left(\frac{2\,\mathrm{Tan}(22.5^o)}{1 - \mathrm{Tan}(22.5^o)^2} = (\mathrm{Tan}(45^o) = 1)\right) & .10 = \left(\mathrm{Cos}(70^o)\,\mathrm{Cos}(10^o) + \mathrm{Sin}(70^o)\,\mathrm{Sin}(10^o) = \left(\mathrm{Cos}(60^o) = \frac{1}{2}\right)\right) \end{bmatrix}, \quad , \begin{bmatrix} \underline{:)} \\ :(\\ \underline{:)} \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ \underline{:)} \\ :(\\ \underline{:)} \\ :(\\ \underline{:)} \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{2\sqrt{6}}{7}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{\sqrt{39}}{8}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = \frac{5\sqrt{39}}{39}\right) & .4 = \left(\mathrm{Sin}(\beta - \alpha) = -\frac{25}{56} + \frac{\sqrt{6}\sqrt{39}}{28}\right) \\ .5 = \left(\mathrm{Cos}(\alpha - \beta) = -\frac{5\sqrt{39}}{56} - \frac{5\sqrt{6}}{28}\right) & .6 = \left(\mathrm{Tan}(\alpha + \beta) = \frac{128\sqrt{2}\sqrt{3}}{75} + \frac{49\sqrt{3}\sqrt{13}}{75}\right) \\ .7 = \left(\mathrm{Cos}(2\alpha) = \frac{1}{49}\right) & .8 = \left(\mathrm{Tan}(2\beta) = \frac{5\sqrt{39}}{7}\right) \end{bmatrix}, \quad , Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = -\frac{\sqrt{3}}{2}\right) & .2 = \left(\mathrm{Sin}(\beta) = -\frac{3\sqrt{5}}{7}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = -\frac{\sqrt{3}}{3}\right) & .4 = \left(\mathrm{Sin}(\alpha + \beta) = \frac{1}{7} + \frac{3\sqrt{5}\sqrt{3}}{14}\right) \\ .5 = \left(\mathrm{Cos}(\alpha - \beta) = -\frac{\sqrt{3}}{7} - \frac{3\sqrt{5}}{14}\right) & .6 = \left(\mathrm{Tan}(\beta - \alpha) = \frac{8\sqrt{5}}{11} - \frac{49\sqrt{3}}{33}\right) \\ .7 = \left(\mathrm{Sin}(2\alpha) = -\frac{\sqrt{3}}{2}\right) & .8 = \left(\mathrm{Tan}(2\beta) = \frac{12\sqrt{5}}{41}\right) \end{bmatrix}, \quad , \begin{bmatrix} \underline{:)} \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ \underline{:)} \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Cos}(24^o) = (\mathrm{Sqrt}(0.8345) = 0.914)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Sin}(36^o) = (\mathrm{Sqrt}(0.3455) = 0.588)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans1 = \begin{bmatrix} .1 = \left(\text{Cos}(105^o) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\text{Sin}\left(\frac{5\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = \left(\text{Tan}\left(\frac{\pi}{12}\right) = 2 - \sqrt{3}\right) & .4 = \left(\text{Sin}\left(-\frac{7\pi}{12}\right) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .5 = (\text{Sec}(195^o) = -\sqrt{2}\sqrt{3} + \sqrt{2}) & .6 = \left(\text{Cos}(255^o) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .7 = \left(\text{Tan}\left(-\frac{11\pi}{12}\right) = 2 - \sqrt{3}\right) & .8 = (\text{Cot}(285^o) = -2 + \sqrt{3}) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\frac{\text{Tan}\left(\frac{7\pi}{30}\right) - \text{Tan}\left(\frac{\pi}{15}\right)}{1 + \text{Tan}\left(\frac{7\pi}{30}\right)\text{Tan}\left(\frac{\pi}{15}\right)} = \left(\text{Tan}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{3}\right)\right) & .2 = \left(2\,\text{Sin}(15^o)\,\text{Cos}(15^o) = \left(\text{Sin}(30^o) = \frac{1}{2}\right)\right) \\ .3 = \left(\frac{\text{Tan}(12^o) + \text{Tan}(33^o)}{1 - \text{Tan}(12^o)\,\text{Tan}(33^o)} = (\text{Tan}(45^o) = 1)\right) & .4 = \left(\text{Cos}\left(\frac{\pi}{10}\right)\text{Cos}\left(\frac{\pi}{15}\right) - \text{Sin}\left(\frac{\pi}{10}\right)\text{Sin}\left(\frac{\pi}{15}\right) = \left(\text{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .5 = \left(\text{Cos}(72^o)\,\text{Cos}(12^o) + \text{Sin}(72^o)\,\text{Sin}(12^o) = \left(\text{Cos}(60^o) = \frac{1}{2}\right)\right) & .6 = \left(2\,\text{Cos}(22.5^o)^2 - 1 = \left(\text{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .7 = \left(\text{Cos}\left(\frac{\pi}{12}\right)^2 - \text{Sin}\left(\frac{\pi}{12}\right)^2 = \left(\text{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) & .8 = \left(1 - 2\,\text{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\text{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .9 = \left(\text{Sin}(50^o)\,\text{Cos}(10^o) + \text{Cos}(50^o)\,\text{Sin}(10^o) = \left(\text{Sin}(60^o) = \frac{\sqrt{3}}{2}\right)\right) & .10 = \left(\frac{2\,\text{Tan}\left(\frac{\pi}{12}\right)}{1 - \text{Tan}\left(\frac{\pi}{12}\right)^2} = \left(\text{Tan}\left(\frac{\pi}{6}\right) = \text{Tan}\left(\frac{\pi}{6}\right)\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\text{Sin}(\alpha) = \frac{\sqrt{3}}{2}\right) & .2 = \left(\text{Cos}(\beta) = -\frac{\sqrt{5}}{3}\right) \\ .3 = (\text{Tan}(\alpha) = \sqrt{3}) & .4 = \left(\text{Sin}(\alpha - \beta) = -\frac{\sqrt{5}\sqrt{3}}{6} - \frac{1}{3}\right) \\ .5 = \left(\text{Cos}(\beta - \alpha) = -\frac{\sqrt{5}}{6} + \frac{\sqrt{3}}{3}\right) & .6 = \left(\text{Tan}(\alpha + \beta) = -\frac{9\sqrt{3}}{7} + \frac{8\sqrt{5}}{7}\right) \\ .7 = \left(\text{Sin}(2\alpha) = \frac{\sqrt{3}}{2}\right) & .8 = (\text{Tan}(2\beta) = -4\sqrt{5}) \end{bmatrix}, \; Ans4 = \begin{bmatrix} .1 = \left(\text{Sin}(\alpha) = -\frac{\sqrt{3}}{2}\right) & .2 = \left(\text{Cos}(\beta) = \frac{-3}{5}\right) \\ .3 = (\text{Tan}(\alpha) = -\sqrt{3}) & .4 = \left(\text{Sin}(\alpha - \beta) = \frac{3\sqrt{3}}{10} + \frac{2}{5}\right) \\ .5 = \left(\text{Cos}(\alpha + \beta) = -\frac{3}{10} - \frac{2\sqrt{3}}{5}\right) & .6 = \left(\text{Tan}(\beta - \alpha) = -\frac{16}{13} - \frac{25\sqrt{3}}{39}\right) \\ .7 = \left(\text{Cos}(2\beta) = \frac{-7}{25}\right) & .8 = (\text{Tan}(2\alpha) = \sqrt{3}) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\text{Cos}(10^o) = (\text{Sqrt}(0.9700) = 0.985)), \; \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\text{Sin}(32^o) = (\text{Sqrt}(0.2810) = 0.530)), \; \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

TrigonometryExercise4 Answers for No.10063

$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Sin}\left(\frac{\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) & .2 = \left(\mathrm{Cos}(75^o) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .3 = (\mathrm{Tan}(105^o) = -2 - \sqrt{3}) & .4 = \left(\mathrm{Tan}\left(-\frac{17\pi}{12}\right) = -2 - \sqrt{3}\right) \\ .5 = \left(\mathrm{Sin}((-105)^o) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .6 = (\mathrm{Csc}((-345)^o) = \sqrt{2}\sqrt{3} + \sqrt{2}) \\ .7 = \left(\mathrm{Cot}\left(\frac{17\pi}{12}\right) = 2 - \sqrt{3}\right) & .8 = \left(\mathrm{Cos}((-195)^o) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(50^o)\,\mathrm{Cos}(20^o) + \mathrm{Sin}(50^o)\,\mathrm{Sin}(20^o) = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) & .2 = \left(\mathrm{Sin}\left(\frac{5\pi}{9}\right)\mathrm{Cos}\left(\frac{\pi}{18}\right) - \mathrm{Cos}\left(\frac{5\pi}{9}\right)\mathrm{Sin}\left(\frac{\pi}{18}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{2}\right) = 1\right)\right) \\ .3 = \left(1 - 2\,\mathrm{Sin}(22.5^o)^2 = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .4 = \left(2\,\mathrm{Cos}\left(\frac{\pi}{12}\right)^2 - 1 = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .5 = \left(\frac{\mathrm{Tan}(35^o) + \mathrm{Tan}(25^o)}{1 - \mathrm{Tan}(35^o)\,\mathrm{Tan}(25^o)} = (\mathrm{Tan}(60^o) = \sqrt{3})\right) & .6 = \left(\frac{\mathrm{Tan}\left(\frac{\pi}{3}\right) - \mathrm{Tan}\left(\frac{\pi}{12}\right)}{1 + \mathrm{Tan}\left(\frac{\pi}{3}\right)\mathrm{Tan}\left(\frac{\pi}{12}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{4}\right) = 1\right)\right) \\ .7 = \left(2\,\mathrm{Sin}(15^o)\,\mathrm{Cos}(15^o) = \left(\mathrm{Sin}(30^o) = \frac{1}{2}\right)\right) & .8 = \left(\frac{2\,\mathrm{Tan}(22.5^o)}{1 - \mathrm{Tan}(22.5^o)^2} = (\mathrm{Tan}(45^o) = 1)\right) \\ .9 = \left(\mathrm{Sin}\left(\frac{\pi}{9}\right)\mathrm{Cos}\left(\frac{7\pi}{18}\right) + \mathrm{Cos}\left(\frac{\pi}{9}\right)\mathrm{Sin}\left(\frac{7\pi}{18}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{2}\right) = 1\right)\right) & .10 = \left(\mathrm{Cos}\left(\frac{\pi}{8}\right)^2 - \mathrm{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \left[\left[\begin{matrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{matrix}\right]\right] \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{\sqrt{55}}{8}\right) & .2 = \left(\mathrm{Cos}(\beta) = \frac{4}{5}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = \frac{\sqrt{55}}{3}\right) & .4 = \left(\mathrm{Sin}(\alpha + \beta) = \frac{\sqrt{55}}{10} - \frac{9}{40}\right) \\ .5 = \left(\mathrm{Cos}(\beta - \alpha) = \frac{3}{10} - \frac{3\sqrt{55}}{40}\right) & .6 = \left(\mathrm{Tan}(\alpha - \beta) = -\frac{25\sqrt{55}}{117} - \frac{256}{117}\right) \\ .7 = \left(\mathrm{Sin}(2\alpha) = \frac{3\sqrt{55}}{32}\right) & .8 = \left(\mathrm{Tan}(2\beta) = \frac{-24}{7}\right) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = -\frac{\sqrt{3}}{2}\right) & .2 = \left(\mathrm{Sin}(\beta) = \frac{2\sqrt{6}}{7}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = -\frac{2\sqrt{6}}{5}\right) & .4 = \left(\mathrm{Sin}(\alpha - \beta) = \frac{5}{14} + \frac{\sqrt{3}\sqrt{6}}{7}\right) \\ .5 = \left(\mathrm{Cos}(\alpha + \beta) = \frac{5\sqrt{3}}{14} + \frac{\sqrt{6}}{7}\right) & .6 = \left(\mathrm{Tan}(\beta - \alpha) = -\frac{40\sqrt{2}\sqrt{3}}{51} - \frac{49\sqrt{3}}{51}\right) \\ .7 = \left(\mathrm{Sin}(2\alpha) = \frac{\sqrt{3}}{2}\right) & .8 = (\mathrm{Tan}(2\beta) = -20\sqrt{6}) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Sin}(31^o) = (\mathrm{Sqrt}(0.2655) = 0.515)), \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Cos}(13^o) = (\mathrm{Sqrt}(0.9495) = 0.974)), \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Cos}\left(\frac{7\pi}{12}\right) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\mathrm{Sin}(15^o) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .3 = \left(\mathrm{Tan}\left(\frac{5\pi}{12}\right) = 2 + \sqrt{3}\right) & .4 = \left(\mathrm{Sin}\left(\frac{19\pi}{12}\right) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .5 = (\mathrm{Tan}(195^o) = 2 - \sqrt{3}) & .6 = (\mathrm{Cot}(345^o) = -2 - \sqrt{3}) \\ .7 = \left(\mathrm{Csc}\left(-\frac{5\pi}{12}\right) = -\sqrt{2}\sqrt{3} + \sqrt{2}\right) & .8 = \left(\mathrm{Cos}(165^o) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(1 - 2\,\mathrm{Sin}(22.5^o)^2 = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .2 = \left(\mathrm{Cos}\left(\frac{\pi}{12}\right)\mathrm{Cos}\left(\frac{\pi}{6}\right) - \mathrm{Sin}\left(\frac{\pi}{12}\right)\mathrm{Sin}\left(\frac{\pi}{6}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .3 = \left(\frac{2\,\mathrm{Tan}\left(\frac{\pi}{12}\right)}{1 - \mathrm{Tan}\left(\frac{\pi}{12}\right)^2} = \left(\mathrm{Tan}\left(\frac{\pi}{6}\right) = \mathrm{Tan}\left(\frac{\pi}{6}\right)\right)\right) & .4 = \left(\frac{\mathrm{Tan}\left(\frac{2\pi}{9}\right) + \mathrm{Tan}\left(\frac{\pi}{9}\right)}{1 - \mathrm{Tan}\left(\frac{2\pi}{9}\right)\mathrm{Tan}\left(\frac{\pi}{9}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{3}\right) = \sqrt{3}\right)\right) \\ .5 = \left(2\,\mathrm{Cos}\left(\frac{\pi}{12}\right)^2 - 1 = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) & .6 = \left(\mathrm{Sin}(20^o)\mathrm{Cos}(10^o) + \mathrm{Cos}(20^o)\mathrm{Sin}(10^o) = \left(\mathrm{Sin}(30^o) = \frac{1}{2}\right)\right) \\ .7 = \left(\mathrm{Cos}(15^o)^2 - \mathrm{Sin}(15^o)^2 = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) & .8 = \left(\frac{\mathrm{Tan}\left(\frac{4\pi}{9}\right) - \mathrm{Tan}\left(\frac{\pi}{9}\right)}{1 + \mathrm{Tan}\left(\frac{4\pi}{9}\right)\mathrm{Tan}\left(\frac{\pi}{9}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{3}\right) = \sqrt{3}\right)\right) \\ .9 = (\mathrm{Sin}(102^o)\mathrm{Cos}(12^o) - \mathrm{Cos}(102^o)\mathrm{Sin}(12^o) = (\mathrm{Sin}(90^o) = 1)) & .10 = \left(2\,\mathrm{Sin}\left(\frac{\pi}{8}\right)\mathrm{Cos}\left(\frac{\pi}{8}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{2\sqrt{2}}{3}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{\sqrt{21}}{5}\right) \\ .3 = (\mathrm{Tan}(\alpha) = 2\sqrt{2}) & .4 = \left(\mathrm{Sin}(\alpha + \beta) = -\frac{2\sqrt{2}\sqrt{21}}{15} - \frac{2}{15}\right) \\ .5 = \left(\mathrm{Cos}(\beta - \alpha) = -\frac{\sqrt{21}}{15} - \frac{4\sqrt{2}}{15}\right) & .6 = \left(\mathrm{Tan}(\alpha - \beta) = -\frac{50\sqrt{2}}{11} + \frac{18\sqrt{21}}{11}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{17}{25}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = -\frac{4\sqrt{2}}{7}\right) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = -\frac{\sqrt{35}}{6}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{2\sqrt{2}}{3}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = -\frac{\sqrt{2}}{4}\right) & .4 = \left(\mathrm{Sin}(\beta - \alpha) = \frac{1}{18} - \frac{\sqrt{2}\sqrt{35}}{9}\right) \\ .5 = \left(\mathrm{Cos}(\alpha + \beta) = -\frac{\sqrt{2}}{9} + \frac{\sqrt{35}}{18}\right) & .6 = \left(\mathrm{Tan}(\alpha - \beta) = \frac{\sqrt{35}}{3} - \frac{8\sqrt{2}}{3}\right) \\ .7 = \left(\mathrm{Sin}(2\alpha) = -\frac{\sqrt{35}}{18}\right) & .8 = \left(\mathrm{Tan}(2\beta) = -\frac{4\sqrt{2}}{7}\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Sin}(43^o) = (\mathrm{Sqrt}(0.4650) = 0.682)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Cos}(31^o) = (\mathrm{Sqrt}(0.7345) = 0.857)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(15^{o}) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) & .2 = \left(\mathrm{Cos}\left(\frac{7\pi}{12}\right) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = (\mathrm{Tan}(75^{o}) = 2+\sqrt{3}) & .4 = (\mathrm{Cot}(165^{o}) = -2-\sqrt{3}) \\ .5 = \left(\mathrm{Tan}\left(\frac{13\pi}{12}\right) = 2-\sqrt{3}\right) & .6 = \left(\mathrm{Cos}\left(-\frac{5\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .7 = (\mathrm{Sec}(255^{o}) = -\sqrt{2} - \sqrt{2}\sqrt{3}) & .8 = (\mathrm{Csc}((\text{-}195)^{o}) = \sqrt{2}\sqrt{3} + \sqrt{2}) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(2\,\mathrm{Cos}\left(\frac{\pi}{12}\right)^2 - 1 = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) & .2 = \left(\frac{\mathrm{Tan}(12^{o}) + \mathrm{Tan}(18^{o})}{1 - \mathrm{Tan}(12^{o})\,\mathrm{Tan}(18^{o})} = \left(\mathrm{Tan}(30^{o}) = \frac{\sqrt{3}}{3}\right)\right) \\ .3 = \left(1 - 2\,\mathrm{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .4 = \left(\mathrm{Cos}(20^{o})\,\mathrm{Cos}(40^{o}) - \mathrm{Sin}(20^{o})\,\mathrm{Sin}(40^{o}) = \left(\mathrm{Cos}(60^{o}) = \frac{1}{2}\right)\right) \\ .5 = \left(2\,\mathrm{Sin}(22.5^{o})\,\mathrm{Cos}(22.5^{o}) = \left(\mathrm{Sin}(45^{o}) = \frac{\sqrt{2}}{2}\right)\right) & .6 = \left(\mathrm{Cos}(15^{o})^2 - \mathrm{Sin}(15^{o})^2 = \left(\mathrm{Cos}(30^{o}) = \frac{\sqrt{3}}{2}\right)\right) \\ .7 = \left(\frac{2\,\mathrm{Tan}(22.5^{o})}{1 - \mathrm{Tan}(22.5^{o})^2} = (\mathrm{Tan}(45^{o}) = 1)\right) & .8 = \left(\mathrm{Cos}\left(\frac{2\pi}{5}\right)\mathrm{Cos}\left(\frac{\pi}{15}\right) + \mathrm{Sin}\left(\frac{2\pi}{5}\right)\mathrm{Sin}\left(\frac{\pi}{15}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{3}\right) = \frac{1}{2}\right)\right) \\ .9 = \left(\mathrm{Sin}\left(\frac{7\pi}{30}\right)\mathrm{Cos}\left(\frac{\pi}{15}\right) - \mathrm{Cos}\left(\frac{7\pi}{30}\right)\mathrm{Sin}\left(\frac{\pi}{15}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) & .10 = \left(\mathrm{Sin}\left(\frac{\pi}{9}\right)\mathrm{Cos}\left(\frac{5\pi}{36}\right) + \mathrm{Cos}\left(\frac{\pi}{9}\right)\mathrm{Sin}\left(\frac{5\pi}{36}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{\sqrt{21}}{5}\right) & .2 = \left(\mathrm{Sin}(\beta) = \frac{2\sqrt{6}}{7}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = \frac{2\sqrt{21}}{21}\right) & .4 = \left(\mathrm{Sin}(\alpha+\beta) = -\frac{2}{7} + \frac{2\sqrt{21}\sqrt{6}}{35}\right) \\ .5 = \left(\mathrm{Cos}(\alpha-\beta) = -\frac{\sqrt{21}}{7} + \frac{4\sqrt{6}}{35}\right) & .6 = \left(\mathrm{Tan}(\beta-\alpha) = -\frac{250\sqrt{2}\sqrt{3}}{429} - \frac{98\sqrt{7}\sqrt{3}}{429}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{1}{49}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = \frac{4\sqrt{21}}{17}\right) \end{bmatrix}, \quad , \; Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{2\sqrt{10}}{7}\right) & .2 = \left(\mathrm{Sin}(\beta) = -\frac{\sqrt{3}}{2}\right) \\ .3 = (\mathrm{Tan}(\beta) = \sqrt{3}) & .4 = \left(\mathrm{Sin}(\alpha-\beta) = \frac{3}{14} + \frac{\sqrt{10}\sqrt{3}}{7}\right) \\ .5 = \left(\mathrm{Cos}(\beta-\alpha) = -\frac{\sqrt{10}}{7} + \frac{3\sqrt{3}}{14}\right) & .6 = \left(\mathrm{Tan}(\alpha+\beta) = -\frac{24\sqrt{10}}{13} + \frac{49\sqrt{3}}{13}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{\text{-}1}{2}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = -\frac{12\sqrt{10}}{31}\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Cos}(34^{o}) = (\mathrm{Sqrt}(0.6875) = 0.829)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Sin}(11^{o}) = (\mathrm{Sqrt}(0.0365) = 0.191)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

TrigonometryExercise4 Answers for No.10372

$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Cos}\left(\frac{7\pi}{12}\right) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\mathrm{Sin}(75^o) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = (\mathrm{Tan}(15^o) = 2 - \sqrt{3}) & .4 = (\mathrm{Cot}(195^o) = 2 + \sqrt{3}) \\ .5 = \left(\mathrm{Tan}\left(-\frac{19\pi}{12}\right) = 2 + \sqrt{3}\right) & .6 = \left(\mathrm{Csc}\left(\frac{23\pi}{12}\right) = -\sqrt{2} - \sqrt{2}\sqrt{3}\right) \\ .7 = \left(\mathrm{Cos}(165^o) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .8 = (\mathrm{Sec}(255^o) = -\sqrt{2} - \sqrt{2}\sqrt{3}) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(15^o)^2 - \mathrm{Sin}(15^o)^2 = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) & .2 = \left(\mathrm{Sin}\left(\frac{\pi}{18}\right)\mathrm{Cos}\left(\frac{5\pi}{18}\right) + \mathrm{Cos}\left(\frac{\pi}{18}\right)\mathrm{Sin}\left(\frac{5\pi}{18}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{3}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .3 = \left(\mathrm{Sin}\left(\frac{17\pi}{30}\right)\mathrm{Cos}\left(\frac{\pi}{15}\right) - \mathrm{Cos}\left(\frac{17\pi}{30}\right)\mathrm{Sin}\left(\frac{\pi}{15}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{2}\right) = 1\right)\right) & .4 = \left(1 - 2\,\mathrm{Sin}\left(\frac{\pi}{12}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .5 = \left(\frac{2\,\mathrm{Tan}\left(\frac{\pi}{12}\right)}{1 - \mathrm{Tan}\left(\frac{\pi}{12}\right)^2} = \left(\mathrm{Tan}\left(\frac{\pi}{6}\right) = \mathrm{Tan}\left(\frac{\pi}{6}\right)\right)\right) & .6 = \left(\mathrm{Cos}(15^o)\,\mathrm{Cos}(30^o) - \mathrm{Sin}(15^o)\,\mathrm{Sin}(30^o) = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .7 = \left(\mathrm{Cos}(70^o)\,\mathrm{Cos}(10^o) + \mathrm{Sin}(70^o)\,\mathrm{Sin}(10^o) = \left(\mathrm{Cos}(60^o) = \frac{1}{2}\right)\right) & .8 = \left(2\,\mathrm{Cos}(22.5^o)^2 - 1 = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .9 = \left(2\,\mathrm{Sin}\left(\frac{\pi}{8}\right)\mathrm{Cos}\left(\frac{\pi}{8}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .10 = \left(\frac{\mathrm{Tan}\left(\frac{5\pi}{18}\right) - \mathrm{Tan}\left(\frac{\pi}{9}\right)}{1 + \mathrm{Tan}\left(\frac{5\pi}{18}\right)\mathrm{Tan}\left(\frac{\pi}{9}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{3}\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{\sqrt{3}}{2}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{\sqrt{5}}{3}\right) \\ .3 = (\mathrm{Tan}(\alpha) = \sqrt{3}) & .4 = \left(\mathrm{Sin}(\alpha+\beta) = -\frac{\sqrt{5}\sqrt{3}}{6} - \frac{1}{3}\right) \\ .5 = \left(\mathrm{Cos}(\alpha-\beta) = -\frac{\sqrt{5}}{6} - \frac{\sqrt{3}}{3}\right) & .6 = \left(\mathrm{Tan}(\beta-\alpha) = -\frac{8\sqrt{5}}{7} + \frac{9\sqrt{3}}{7}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = \frac{4\sqrt{5}}{9}\right) & .8 = (\mathrm{Tan}(2\alpha) = -\sqrt{3}) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{\sqrt{33}}{7}\right) & .2 = \left(\mathrm{Cos}(\beta) = \frac{\sqrt{3}}{2}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = -\frac{\sqrt{33}}{4}\right) & .4 = \left(\mathrm{Sin}(\alpha-\beta) = \frac{\sqrt{33}\sqrt{3}}{14} - \frac{2}{7}\right) \\ .5 = \left(\mathrm{Cos}(\beta-\alpha) = -\frac{2\sqrt{3}}{7} - \frac{\sqrt{33}}{14}\right) & .6 = \left(\mathrm{Tan}(\alpha+\beta) = -\frac{16\sqrt{3}\sqrt{11}}{15} - \frac{49\sqrt{3}}{15}\right) \\ .7 = \left(\mathrm{Cos}(2\alpha) = \frac{-17}{49}\right) & .8 = (\mathrm{Tan}(2\beta) = -\sqrt{3}) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Sin}(22^o) = (\mathrm{Sqrt}(0.1405) = 0.375)), \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Cos}(12^o) = (\mathrm{Sqrt}(0.9570) = 0.978)), \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(75^o) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\mathrm{Cos}\left(\frac{7\pi}{12}\right) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = \left(\mathrm{Tan}\left(\frac{\pi}{12}\right) = 2 - \sqrt{3}\right) & .4 = (\mathrm{Sec}((-165)^o) = -\sqrt{2}\sqrt{3} + \sqrt{2}) \\ .5 = \left(\mathrm{Tan}\left(\frac{19\pi}{12}\right) = -2 - \sqrt{3}\right) & .6 = \left(\mathrm{Sin}\left(-\frac{13\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .7 = (\mathrm{Csc}(195^o) = -\sqrt{2} - \sqrt{2}\sqrt{3}) & .8 = \left(\mathrm{Cos}\left(\frac{23\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(22.5^o)^2 - \mathrm{Sin}(22.5^o)^2 = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .2 = \left(\mathrm{Cos}\left(\frac{\pi}{18}\right)\mathrm{Cos}\left(\frac{5\pi}{18}\right) - \mathrm{Sin}\left(\frac{\pi}{18}\right)\mathrm{Sin}\left(\frac{5\pi}{18}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{3}\right) = \frac{1}{2}\right)\right) \\ .3 = \left(\frac{\mathrm{Tan}\left(\frac{19\pi}{60}\right) - \mathrm{Tan}\left(\frac{\pi}{15}\right)}{1 + \mathrm{Tan}\left(\frac{19\pi}{60}\right)\mathrm{Tan}\left(\frac{\pi}{15}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{4}\right) = 1\right)\right) & .4 = \left(1 - 2\,\mathrm{Sin}(15^o)^2 = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) \\ .5 = \left(\frac{\mathrm{Tan}(12^o) + \mathrm{Tan}(33^o)}{1 - \mathrm{Tan}(12^o)\,\mathrm{Tan}(33^o)} = (\mathrm{Tan}(45^o) = 1)\right) & .6 = (\mathrm{Sin}(12^o)\,\mathrm{Cos}(78^o) + \mathrm{Cos}(12^o)\,\mathrm{Sin}(78^o) = (\mathrm{Sin}(90^o) = 1)) \\ .7 = \left(\frac{2\,\mathrm{Tan}(22.5^o)}{1 - \mathrm{Tan}(22.5^o)^2} = (\mathrm{Tan}(45^o) = 1)\right) & .8 = \left(2\,\mathrm{Cos}\left(\frac{\pi}{8}\right)^2 - 1 = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .9 = \left(2\,\mathrm{Sin}\left(\frac{\pi}{12}\right)\mathrm{Cos}\left(\frac{\pi}{12}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) & .10 = \left(\mathrm{Cos}(40^o)\,\mathrm{Cos}(10^o) + \mathrm{Sin}(40^o)\,\mathrm{Sin}(10^o) = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{2\sqrt{6}}{5}\right) & .2 = \left(\mathrm{Sin}(\beta) = \frac{4}{5}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = \frac{\sqrt{6}}{12}\right) & .4 = \left(\mathrm{Sin}(\beta - \alpha) = \frac{8\sqrt{6}}{25} + \frac{3}{25}\right) \\ .5 = \left(\mathrm{Cos}(\alpha + \beta) = -\frac{6\sqrt{6}}{25} - \frac{4}{25}\right) & .6 = \left(\mathrm{Tan}(\alpha - \beta) = \frac{\sqrt{6}}{4} + \frac{3}{2}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{-7}{25}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = \frac{4\sqrt{6}}{23}\right) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{\sqrt{35}}{6}\right) & .2 = \left(\mathrm{Sin}(\beta) = -\frac{\sqrt{3}}{2}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = -\frac{\sqrt{35}}{35}\right) & .4 = \left(\mathrm{Sin}(\alpha - \beta) = \frac{1}{12} + \frac{\sqrt{35}\sqrt{3}}{12}\right) \\ .5 = \left(\mathrm{Cos}(\beta - \alpha) = -\frac{\sqrt{35}}{12} + \frac{\sqrt{3}}{12}\right) & .6 = \left(\mathrm{Tan}(\alpha + \beta) = -\frac{\sqrt{35}}{8} + \frac{9\sqrt{3}}{8}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = \frac{\sqrt{3}}{2}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = -\frac{\sqrt{35}}{17}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Sin}(38^o) = (\mathrm{Sqrt}(0.3790) = 0.616)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Cos}(26^o) = (\mathrm{Sqrt}(0.8080) = 0.899)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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$$Ans1 = \begin{bmatrix} .1 = \left(\text{Cos}\left(\frac{\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\text{Sin}(105^{o}) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = \left(\text{Tan}\left(\frac{5\pi}{12}\right) = 2 + \sqrt{3}\right) & .4 = \left(\text{Sec}\left(-\frac{5\pi}{12}\right) = \sqrt{2}\sqrt{3} + \sqrt{2}\right) \\ .5 = \left(\text{Sin}((\text{-}15)^{o}) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .6 = \left(\text{Csc}((\text{-}285)^{o}) = -\sqrt{2} + \sqrt{2}\sqrt{3}\right) \\ .7 = \left(\text{Cot}\left(-\frac{13\pi}{12}\right) = -2 - \sqrt{3}\right) & .8 = \left(\text{Tan}(195^{o}) = 2 - \sqrt{3}\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(2\,\text{Cos}\left(\frac{\pi}{12}\right)^2 - 1 = \left(\text{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) & .2 = \left(1 - 2\,\text{Sin}(15^{o})^2 = \left(\text{Cos}(30^{o}) = \frac{\sqrt{3}}{2}\right)\right) \\ .3 = \left(\text{Sin}(42^{o})\,\text{Cos}(12^{o}) - \text{Cos}(42^{o})\,\text{Sin}(12^{o}) = \left(\text{Sin}(30^{o}) = \frac{1}{2}\right)\right) & .4 = \left(\frac{2\,\text{Tan}(22.5^{o})}{1 - \text{Tan}(22.5^{o})^2} = (\text{Tan}(45^{o}) = 1)\right) \\ .5 = (\text{Cos}(100^{o})\,\text{Cos}(10^{o}) + \text{Sin}(100^{o})\,\text{Sin}(10^{o}) = (\text{Cos}(90^{o}) = 0)) & .6 = \left(\text{Cos}\left(\frac{\pi}{8}\right)^2 - \text{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\text{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .7 = \left(\text{Cos}\left(\frac{\pi}{9}\right)\text{Cos}\left(\frac{2\pi}{9}\right) - \text{Sin}\left(\frac{\pi}{9}\right)\text{Sin}\left(\frac{2\pi}{9}\right) = \left(\text{Cos}\left(\frac{\pi}{3}\right) = \frac{1}{2}\right)\right) & .8 = \left(2\,\text{Sin}(22.5^{o})\,\text{Cos}(22.5^{o}) = \left(\text{Sin}(45^{o}) = \frac{\sqrt{2}}{2}\right)\right) \\ .9 = \left(\frac{\text{Tan}\left(\frac{7\pi}{18}\right) - \text{Tan}\left(\frac{\pi}{18}\right)}{1 + \text{Tan}\left(\frac{7\pi}{18}\right)\text{Tan}\left(\frac{\pi}{18}\right)} = \left(\text{Tan}\left(\frac{\pi}{3}\right) = \sqrt{3}\right)\right) & .10 = \left(\frac{\text{Tan}\left(\frac{11\pi}{60}\right) + \text{Tan}\left(\frac{\pi}{15}\right)}{1 - \text{Tan}\left(\frac{11\pi}{60}\right)\text{Tan}\left(\frac{\pi}{15}\right)} = \left(\text{Tan}\left(\frac{\pi}{4}\right) = 1\right)\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \left[\left[\begin{matrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{matrix}\right]\right] \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\text{Cos}(\alpha) = \frac{\sqrt{3}}{2}\right) & .2 = \left(\text{Sin}(\beta) = \frac{\text{-}3}{5}\right) \\ .3 = \left(\text{Tan}(\beta) = \frac{3}{4}\right) & .4 = \left(\text{Sin}(\alpha+\beta) = -\frac{2}{5} - \frac{3\sqrt{3}}{10}\right) \\ .5 = \left(\text{Cos}(\alpha-\beta) = -\frac{3}{10} - \frac{2\sqrt{3}}{5}\right) & .6 = \left(\text{Tan}(\beta-\alpha) = -\frac{25\sqrt{3}}{39} + \frac{16}{13}\right) \\ .7 = \left(\text{Sin}(2\beta) = \frac{24}{25}\right) & .8 = \left(\text{Tan}(2\alpha) = \sqrt{3}\right) \end{bmatrix}, \quad , \quad Ans4 = \begin{bmatrix} .1 = \left(\text{Sin}(\alpha) = -\frac{\sqrt{3}}{2}\right) & .2 = \left(\text{Cos}(\beta) = -\frac{\sqrt{55}}{8}\right) \\ .3 = \left(\text{Tan}(\beta) = -\frac{3\sqrt{55}}{55}\right) & .4 = \left(\text{Sin}(\alpha+\beta) = \frac{\sqrt{3}\sqrt{55}}{16} + \frac{3}{16}\right) \\ .5 = \left(\text{Cos}(\alpha-\beta) = -\frac{\sqrt{55}}{16} - \frac{3\sqrt{3}}{16}\right) & .6 = \left(\text{Tan}(\beta-\alpha) = -\frac{3\sqrt{55}}{7} + \frac{16\sqrt{3}}{7}\right) \\ .7 = \left(\text{Sin}(2\alpha) = -\frac{\sqrt{3}}{2}\right) & .8 = \left(\text{Tan}(2\beta) = -\frac{3\sqrt{55}}{23}\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\text{Cos}(6^{o}) = (\text{Sqrt}(0.9890) = 0.995)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\text{Sin}(24^{o}) = (\text{Sqrt}(0.1655) = 0.407)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Cos}\left(\frac{5\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) & .2 = \left(\mathrm{Sin}(105^o) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = (\mathrm{Tan}(15^o) = 2 - \sqrt{3}) & .4 = \left(\mathrm{Sin}\left(-\frac{13\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .5 = (\mathrm{Sec}((-75)^o) = \sqrt{2}\sqrt{3} + \sqrt{2}) & .6 = \left(\mathrm{Cos}(165^o) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .7 = \left(\mathrm{Tan}\left(-\frac{17\pi}{12}\right) = -2 - \sqrt{3}\right) & .8 = \left(\mathrm{Cot}\left(\frac{13\pi}{12}\right) = 2 + \sqrt{3}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\mathrm{Cos}\left(\frac{\pi}{12}\right)^2 - \mathrm{Sin}\left(\frac{\pi}{12}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) & .2 = \left(1 - 2\,\mathrm{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .3 = \left(2\,\mathrm{Cos}(15^o)^2 - 1 = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) & .4 = \left(\mathrm{Cos}(12^o)\,\mathrm{Cos}(18^o) - \mathrm{Sin}(12^o)\,\mathrm{Sin}(18^o) = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) \\ .5 = \left(\mathrm{Cos}\left(\frac{7\pi}{30}\right)\mathrm{Cos}\left(\frac{\pi}{15}\right) + \mathrm{Sin}\left(\frac{7\pi}{30}\right)\mathrm{Sin}\left(\frac{\pi}{15}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) & .6 = \left(\mathrm{Sin}\left(\frac{4\pi}{9}\right)\mathrm{Cos}\left(\frac{\pi}{18}\right) + \mathrm{Cos}\left(\frac{4\pi}{9}\right)\mathrm{Sin}\left(\frac{\pi}{18}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{2}\right) = 1\right)\right) \\ .7 = \left(\mathrm{Sin}\left(\frac{17\pi}{30}\right)\mathrm{Cos}\left(\frac{\pi}{15}\right) - \mathrm{Cos}\left(\frac{17\pi}{30}\right)\mathrm{Sin}\left(\frac{\pi}{15}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{2}\right) = 1\right)\right) & .8 = \left(\frac{2\,\mathrm{Tan}\left(\frac{\pi}{8}\right)}{1 - \mathrm{Tan}\left(\frac{\pi}{8}\right)^2} = \left(\mathrm{Tan}\left(\frac{\pi}{4}\right) = \mathrm{Tan}\left(\frac{\pi}{4}\right)\right)\right) \\ .9 = \left(\frac{\mathrm{Tan}(20^o) + \mathrm{Tan}(25^o)}{1 - \mathrm{Tan}(20^o)\,\mathrm{Tan}(25^o)} = (\mathrm{Tan}(45^o) = 1)\right) & .10 = \left(2\,\mathrm{Sin}(22.5^o)\,\mathrm{Cos}(22.5^o) = \left(\mathrm{Sin}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \left[\left[\begin{matrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{matrix}\right]\right] \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{\sqrt{3}}{2}\right) & .2 = \left(\mathrm{Sin}(\beta) = -\frac{\sqrt{7}}{4}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = \frac{\sqrt{3}}{3}\right) & .4 = \left(\mathrm{Sin}(\alpha + \beta) = -\frac{\sqrt{7}\sqrt{3}}{8} - \frac{3}{8}\right) \\ .5 = \left(\mathrm{Cos}(\beta - \alpha) = -\frac{3\sqrt{3}}{8} - \frac{\sqrt{7}}{8}\right) & .6 = \left(\mathrm{Tan}(\alpha - \beta) = \frac{4\sqrt{3}}{5} - \frac{3\sqrt{7}}{5}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = \frac{3\sqrt{7}}{8}\right) & .8 = (\mathrm{Tan}(2\alpha) = \sqrt{3}) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = -\frac{2\sqrt{6}}{7}\right) & .2 = \left(\mathrm{Sin}(\beta) = -\frac{\sqrt{3}}{2}\right) \\ .3 = (\mathrm{Tan}(\beta) = -\sqrt{3}) & .4 = \left(\mathrm{Sin}(\beta - \alpha) = \frac{\sqrt{3}\sqrt{6}}{7} - \frac{5}{14}\right) \\ .5 = \left(\mathrm{Cos}(\alpha + \beta) = -\frac{\sqrt{6}}{7} + \frac{5\sqrt{3}}{14}\right) & .6 = \left(\mathrm{Tan}(\alpha - \beta) = \frac{40\sqrt{2}\sqrt{3}}{51} - \frac{49\sqrt{3}}{51}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{-1}{2}\right) & .8 = (\mathrm{Tan}(2\alpha) = 20\sqrt{6}) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Cos}(5^o) = (\mathrm{Sqrt}(0.9925) = 0.996)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Sin}(40^o) = (\mathrm{Sqrt}(0.4130) = 0.643)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(15^o) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) & .2 = \left(\mathrm{Cos}\left(\frac{7\pi}{12}\right) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = (\mathrm{Tan}(75^o) = 2 + \sqrt{3}) & .4 = (\mathrm{Csc}((-15)^o) = -\sqrt{2} - \sqrt{2}\sqrt{3}) \\ .5 = \left(\mathrm{Sec}\left(-\frac{5\pi}{12}\right) = \sqrt{2}\sqrt{3} + \sqrt{2}\right) & .6 = \left(\mathrm{Cos}((-165)^o) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .7 = \left(\mathrm{Sin}\left(\frac{17\pi}{12}\right) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .8 = (\mathrm{Tan}((-105)^o) = 2 + \sqrt{3}) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(2\,\mathrm{Sin}(22.5^o)\,\mathrm{Cos}(22.5^o) = \left(\mathrm{Sin}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .2 = \left(\mathrm{Cos}\left(\frac{\pi}{36}\right)\mathrm{Cos}\left(\frac{5\pi}{36}\right) - \mathrm{Sin}\left(\frac{\pi}{36}\right)\mathrm{Sin}\left(\frac{5\pi}{36}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .3 = (\mathrm{Sin}(15^o)\,\mathrm{Cos}(75^o) + \mathrm{Cos}(15^o)\,\mathrm{Sin}(75^o) = (\mathrm{Sin}(90^o) = 1)) & .4 = \left(\mathrm{Cos}\left(\frac{\pi}{8}\right)^2 - \mathrm{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .5 = \left(\frac{\mathrm{Tan}(42^o) - \mathrm{Tan}(12^o)}{1 + \mathrm{Tan}(42^o)\,\mathrm{Tan}(12^o)} = \left(\mathrm{Tan}(30^o) = \frac{\sqrt{3}}{3}\right)\right) & .6 = \left(\mathrm{Cos}\left(\frac{4\pi}{9}\right)\mathrm{Cos}\left(\frac{\pi}{9}\right) + \mathrm{Sin}\left(\frac{4\pi}{9}\right)\mathrm{Sin}\left(\frac{\pi}{9}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{3}\right) = \frac{1}{2}\right)\right) \\ .7 = \left(2\,\mathrm{Cos}(15^o)^2 - 1 = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) & .8 = \left(\mathrm{Sin}\left(\frac{11\pi}{18}\right)\mathrm{Cos}\left(\frac{\pi}{9}\right) - \mathrm{Cos}\left(\frac{11\pi}{18}\right)\mathrm{Sin}\left(\frac{\pi}{9}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{2}\right) = 1\right)\right) \\ .9 = \left(\frac{2\,\mathrm{Tan}\left(\frac{\pi}{12}\right)}{1 - \mathrm{Tan}\left(\frac{\pi}{12}\right)^2} = \left(\mathrm{Tan}\left(\frac{\pi}{6}\right) = \mathrm{Tan}\left(\frac{\pi}{6}\right)\right)\right) & .10 = \left(1 - 2\,\mathrm{Sin}\left(\frac{\pi}{12}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \left[\left[\begin{matrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{matrix}\right]\right] \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{\sqrt{39}}{8}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{\sqrt{55}}{8}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = \frac{3\sqrt{55}}{55}\right) & .4 = \left(\mathrm{Sin}(\alpha - \beta) = -\frac{\sqrt{39}\sqrt{55}}{64} + \frac{15}{64}\right) \\ .5 = \left(\mathrm{Cos}(\beta - \alpha) = -\frac{5\sqrt{55}}{64} - \frac{3\sqrt{39}}{64}\right) & .6 = \left(\mathrm{Tan}(\alpha + \beta) = \frac{5\sqrt{39}}{16} + \frac{3\sqrt{55}}{16}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = \frac{3\sqrt{55}}{32}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = -\frac{5\sqrt{39}}{7}\right) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{2\sqrt{14}}{9}\right) & .2 = \left(\mathrm{Cos}(\beta) = \frac{\sqrt{5}}{3}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = -\frac{2\sqrt{14}}{5}\right) & .4 = \left(\mathrm{Sin}(\alpha - \beta) = \frac{2\sqrt{14}\sqrt{5}}{27} - \frac{10}{27}\right) \\ .5 = \left(\mathrm{Cos}(\alpha + \beta) = -\frac{5\sqrt{5}}{27} + \frac{4\sqrt{14}}{27}\right) & .6 = \left(\mathrm{Tan}(\beta - \alpha) = \frac{18\sqrt{5}}{11} - \frac{10\sqrt{14}}{11}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = -\frac{4\sqrt{5}}{9}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = \frac{20\sqrt{14}}{31}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Sin}(8^o) = (\mathrm{Sqrt}(0.0195) = 0.139)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Cos}(31^o) = (\mathrm{Sqrt}(0.7345) = 0.857)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans1 = \begin{bmatrix} .1 = \left(\text{Cos}(105^o) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\text{Sin}\left(\frac{5\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = \left(\text{Tan}\left(\frac{\pi}{12}\right) = 2 - \sqrt{3}\right) & .4 = \left(\text{Sec}\left(-\frac{11\pi}{12}\right) = -\sqrt{2}\sqrt{3} + \sqrt{2}\right) \\ .5 = \left(\text{Sin}((-105)^o) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .6 = \left(\text{Cos}(165^o) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .7 = \left(\text{Csc}\left(-\frac{13\pi}{12}\right) = \sqrt{2}\sqrt{3} + \sqrt{2}\right) & .8 = \left(\text{Tan}\left(-\frac{\pi}{12}\right) = -2 + \sqrt{3}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\frac{2\,\text{Tan}\left(\frac{\pi}{12}\right)}{1 - \text{Tan}\left(\frac{\pi}{12}\right)^2} = \left(\text{Tan}\left(\frac{\pi}{6}\right) = \text{Tan}\left(\frac{\pi}{6}\right)\right)\right) & .2 = \left(\text{Sin}(25^o)\,\text{Cos}(35^o) + \text{Cos}(25^o)\,\text{Sin}(35^o) = \left(\text{Sin}(60^o) = \frac{\sqrt{3}}{2}\right)\right) \\ .3 = \left(\text{Cos}\left(\frac{\pi}{8}\right)^2 - \text{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\text{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .4 = \left(1 - 2\,\text{Sin}(22.5^o)^2 = \left(\text{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .5 = \left(2\,\text{Cos}(15^o)^2 - 1 = \left(\text{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) & .6 = \left(\text{Cos}\left(\frac{\pi}{36}\right)\text{Cos}\left(\frac{5\pi}{36}\right) - \text{Sin}\left(\frac{\pi}{36}\right)\text{Sin}\left(\frac{5\pi}{36}\right) = \left(\text{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .7 = \left(2\,\text{Sin}\left(\frac{\pi}{12}\right)\text{Cos}\left(\frac{\pi}{12}\right) = \left(\text{Sin}\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) & .8 = \left(\text{Sin}\left(\frac{5\pi}{9}\right)\text{Cos}\left(\frac{\pi}{18}\right) - \text{Cos}\left(\frac{5\pi}{9}\right)\text{Sin}\left(\frac{\pi}{18}\right) = \left(\text{Sin}\left(\frac{\pi}{2}\right) = 1\right)\right) \\ .9 = \left(\frac{\text{Tan}(20^o) + \text{Tan}(25^o)}{1 - \text{Tan}(20^o)\,\text{Tan}(25^o)} = (\text{Tan}(45^o) = 1)\right) & .10 = \left(\text{Cos}\left(\frac{19\pi}{60}\right)\text{Cos}\left(\frac{\pi}{15}\right) + \text{Sin}\left(\frac{19\pi}{60}\right)\text{Sin}\left(\frac{\pi}{15}\right) = \left(\text{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ [[M, a, t, h, @, M, U, T]] \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\text{Sin}(\alpha) = \frac{\sqrt{35}}{6}\right) & .2 = \left(\text{Cos}(\beta) = -\frac{\sqrt{3}}{2}\right) \\ .3 = (\text{Tan}(\alpha) = \sqrt{35}) & .4 = \left(\text{Sin}(\beta - \alpha) = \frac{1}{12} + \frac{\sqrt{35}\sqrt{3}}{12}\right) \\ .5 = \left(\text{Cos}(\alpha + \beta) = -\frac{\sqrt{3}}{12} - \frac{\sqrt{35}}{12}\right) & .6 = \left(\text{Tan}(\alpha - \beta) = -\frac{\sqrt{35}}{8} - \frac{9\sqrt{3}}{8}\right) \\ .7 = \left(\text{Cos}(2\beta) = \frac{1}{2}\right) & .8 = \left(\text{Tan}(2\alpha) = -\frac{\sqrt{35}}{17}\right) \end{bmatrix}, \; Ans4 = \begin{bmatrix} .1 = \left(\text{Cos}(\alpha) = \frac{\sqrt{5}}{3}\right) & .2 = \left(\text{Sin}(\beta) = -\frac{\sqrt{15}}{4}\right) \\ .3 = \left(\text{Tan}(\alpha) = -\frac{2\sqrt{5}}{5}\right) & .4 = \left(\text{Sin}(\beta - \alpha) = -\frac{\sqrt{5}\sqrt{15}}{12} - \frac{1}{6}\right) \\ .5 = \left(\text{Cos}(\alpha - \beta) = -\frac{\sqrt{5}}{12} + \frac{\sqrt{15}}{6}\right) & .6 = \left(\text{Tan}(\alpha + \beta) = \frac{32\sqrt{5}}{55} - \frac{9\sqrt{5}\sqrt{3}}{55}\right) \\ .7 = \left(\text{Cos}(2\beta) = \frac{-7}{8}\right) & .8 = (\text{Tan}(2\alpha) = -4\sqrt{5}) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\text{Sin}(42^o) = (\text{Sqrt}(0.4475) = 0.669)), \; \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\text{Cos}(18^o) = (\text{Sqrt}(0.9045) = 0.951)), \; \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(15^o) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) & .2 = \left(\mathrm{Cos}\left(\frac{5\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .3 = (\mathrm{Tan}(105^o) = -2 - \sqrt{3}) & .4 = \left(\mathrm{Csc}\left(\frac{23\pi}{12}\right) = -\sqrt{2} - \sqrt{2}\sqrt{3}\right) \\ .5 = (\mathrm{Tan}((-105)^o) = 2 + \sqrt{3}) & .6 = \left(\mathrm{Sec}\left(\frac{17\pi}{12}\right) = -\sqrt{2} - \sqrt{2}\sqrt{3}\right) \\ .7 = \left(\mathrm{Sin}((-75)^o) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .8 = \left(\mathrm{Cot}\left(\frac{13\pi}{12}\right) = 2 + \sqrt{3}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(1 - 2\,\mathrm{Sin}(15^o)^2 = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) & .2 = \left(\frac{\mathrm{Tan}\left(\frac{2\pi}{9}\right) + \mathrm{Tan}\left(\frac{\pi}{9}\right)}{1 - \mathrm{Tan}\left(\frac{2\pi}{9}\right)\mathrm{Tan}\left(\frac{\pi}{9}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{3}\right) = \sqrt{3}\right)\right) \\ .3 = \left(2\,\mathrm{Sin}\left(\frac{\pi}{8}\right)\mathrm{Cos}\left(\frac{\pi}{8}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .4 = \left(\mathrm{Cos}\left(\frac{5\pi}{18}\right)\mathrm{Cos}\left(\frac{\pi}{9}\right) + \mathrm{Sin}\left(\frac{5\pi}{18}\right)\mathrm{Sin}\left(\frac{\pi}{9}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .5 = \left(\frac{\mathrm{Tan}(72^o) - \mathrm{Tan}(12^o)}{1 + \mathrm{Tan}(72^o)\,\mathrm{Tan}(12^o)} = (\mathrm{Tan}(60^o) = \sqrt{3})\right) & .6 = \left(\mathrm{Cos}\left(\frac{\pi}{12}\right)^2 - \mathrm{Sin}\left(\frac{\pi}{12}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .7 = \left(\mathrm{Cos}\left(\frac{\pi}{36}\right)\mathrm{Cos}\left(\frac{5\pi}{36}\right) - \mathrm{Sin}\left(\frac{\pi}{36}\right)\mathrm{Sin}\left(\frac{5\pi}{36}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) & .8 = \left(2\,\mathrm{Cos}(22.5^o)^2 - 1 = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .9 = \left(\mathrm{Sin}(55^o)\mathrm{Cos}(10^o) - \mathrm{Cos}(55^o)\mathrm{Sin}(10^o) = \left(\mathrm{Sin}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .10 = \left(\frac{2\,\mathrm{Tan}(22.5^o)}{1 - \mathrm{Tan}(22.5^o)^2} = (\mathrm{Tan}(45^o) = 1)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{\sqrt{35}}{6}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{\sqrt{3}}{2}\right) \\ .3 = (\mathrm{Tan}(\alpha) = \sqrt{35}) & .4 = \left(\mathrm{Sin}(\alpha - \beta) = -\frac{\sqrt{35}\sqrt{3}}{12} - \frac{1}{12}\right) \\ .5 = \left(\mathrm{Cos}(\beta - \alpha) = -\frac{\sqrt{3}}{12} + \frac{\sqrt{35}}{12}\right) & .6 = \left(\mathrm{Tan}(\alpha + \beta) = -\frac{\sqrt{35}}{8} + \frac{9\sqrt{3}}{8}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{1}{2}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = -\frac{\sqrt{35}}{17}\right) \end{bmatrix}, Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = -\frac{\sqrt{3}}{2}\right) & .2 = \left(\mathrm{Sin}(\beta) = -\frac{\sqrt{5}}{3}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = \frac{\sqrt{3}}{3}\right) & .4 = \left(\mathrm{Sin}(\beta - \alpha) = \frac{\sqrt{5}\sqrt{3}}{6} + \frac{1}{3}\right) \\ .5 = \left(\mathrm{Cos}(\alpha - \beta) = -\frac{\sqrt{3}}{3} + \frac{\sqrt{5}}{6}\right) & .6 = \left(\mathrm{Tan}(\alpha + \beta) = -\frac{8\sqrt{5}}{7} + \frac{9\sqrt{3}}{7}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = -\frac{4\sqrt{5}}{9}\right) & .8 = (\mathrm{Tan}(2\alpha) = \sqrt{3}) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Cos}(15^o) = (\mathrm{Sqrt}(0.9330) = 0.966)), \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Sin}(26^o) = (\mathrm{Sqrt}(0.1920) = 0.438)), \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Cos}\left(\frac{\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\mathrm{Sin}(75^{o}) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = (\mathrm{Tan}(105^{o}) = -2 - \sqrt{3}) & .4 = \left(\mathrm{Cot}\left(-\frac{23\pi}{12}\right) = 2 + \sqrt{3}\right) \\ .5 = (\mathrm{Tan}((-255)^{o}) = -2 - \sqrt{3}) & .6 = \left(\mathrm{Sin}((-75)^{o}) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .7 = \left(\mathrm{Sec}\left(\frac{23\pi}{12}\right) = -\sqrt{2} + \sqrt{2}\sqrt{3}\right) & .8 = (\mathrm{Csc}((-15)^{o}) = -\sqrt{2} - \sqrt{2}\sqrt{3}) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\frac{2\,\mathrm{Tan}\left(\frac{\pi}{12}\right)}{1 - \mathrm{Tan}\left(\frac{\pi}{12}\right)^2} = \left(\mathrm{Tan}\left(\frac{\pi}{6}\right) = \mathrm{Tan}\left(\frac{\pi}{6}\right)\right)\right) & .2 = \left(\mathrm{Cos}\left(\frac{7\pi}{30}\right)\mathrm{Cos}\left(\frac{\pi}{15}\right) + \mathrm{Sin}\left(\frac{7\pi}{30}\right)\mathrm{Sin}\left(\frac{\pi}{15}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .3 = \left(1 - 2\,\mathrm{Sin}(15^{o})^2 = \left(\mathrm{Cos}(30^{o}) = \frac{\sqrt{3}}{2}\right)\right) & .4 = \left(\frac{\mathrm{Tan}(12^{o}) + \mathrm{Tan}(18^{o})}{1 - \mathrm{Tan}(12^{o})\,\mathrm{Tan}(18^{o})} = \left(\mathrm{Tan}(30^{o}) = \frac{\sqrt{3}}{3}\right)\right) \\ .5 = \left(\mathrm{Cos}\left(\frac{7\pi}{36}\right)\mathrm{Cos}\left(\frac{\pi}{18}\right) - \mathrm{Sin}\left(\frac{7\pi}{36}\right)\mathrm{Sin}\left(\frac{\pi}{18}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .6 = \left(\mathrm{Sin}(12^{o})\,\mathrm{Cos}(48^{o}) + \mathrm{Cos}(12^{o})\,\mathrm{Sin}(48^{o}) = \left(\mathrm{Sin}(60^{o}) = \frac{\sqrt{3}}{2}\right)\right) \\ .7 = \left(2\,\mathrm{Sin}\left(\frac{\pi}{12}\right)\mathrm{Cos}\left(\frac{\pi}{12}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) & .8 = \left(\mathrm{Cos}(22.5^{o})^2 - \mathrm{Sin}(22.5^{o})^2 = \left(\mathrm{Cos}(45^{o}) = \frac{\sqrt{2}}{2}\right)\right) \\ .9 = \left(2\,\mathrm{Cos}\left(\frac{\pi}{8}\right)^2 - 1 = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .10 = \left(\mathrm{Sin}\left(\frac{\pi}{3}\right)\mathrm{Cos}\left(\frac{\pi}{12}\right) - \mathrm{Cos}\left(\frac{\pi}{3}\right)\mathrm{Sin}\left(\frac{\pi}{12}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \left[\left[\begin{matrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{matrix}\right]\right] \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{\sqrt{39}}{8}\right) & .2 = \left(\mathrm{Cos}(\beta) = \frac{\sqrt{65}}{9}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = \frac{\sqrt{39}}{5}\right) & .4 = \left(\mathrm{Sin}(\alpha + \beta) = \frac{\sqrt{39}\sqrt{65}}{72} - \frac{5}{18}\right) \\ .5 = \left(\mathrm{Cos}(\beta - \alpha) = \frac{5\sqrt{65}}{72} - \frac{\sqrt{39}}{18}\right) & .6 = \left(\mathrm{Tan}(\alpha - \beta) = \frac{405\sqrt{3}\sqrt{13}}{1001} + \frac{256\sqrt{13}\sqrt{5}}{1001}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{49}{81}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = -\frac{5\sqrt{39}}{7}\right) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{2\sqrt{10}}{7}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{\sqrt{5}}{3}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = \frac{2\sqrt{5}}{5}\right) & .4 = \left(\mathrm{Sin}(\alpha - \beta) = -\frac{2\sqrt{10}\sqrt{5}}{21} - \frac{2}{7}\right) \\ .5 = \left(\mathrm{Cos}(\alpha + \beta) = \frac{\sqrt{5}}{7} + \frac{4\sqrt{10}}{21}\right) & .6 = \left(\mathrm{Tan}(\beta - \alpha) = -\frac{98\sqrt{5}}{115} - \frac{54\sqrt{2}\sqrt{5}}{115}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = \frac{4\sqrt{5}}{9}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = \frac{12\sqrt{10}}{31}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Cos}(40^{o}) = (\mathrm{Sqrt}(0.5870) = 0.766)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Sin}(24^{o}) = (\mathrm{Sqrt}(0.1655) = 0.407)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(105^{o}) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\mathrm{Sin}\left(\frac{5\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = (\mathrm{Tan}(15^{o}) = 2 - \sqrt{3}) & .4 = (\mathrm{Tan}((\text{-}15)^{o}) = -2 + \sqrt{3}) \\ .5 = \left(\mathrm{Sec}\left(-\frac{23\pi}{12}\right) = -\sqrt{2} + \sqrt{2}\sqrt{3}\right) & .6 = \left(\mathrm{Cos}((\text{-}105)^{o}) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .7 = \left(\mathrm{Csc}\left(\frac{13\pi}{12}\right) = -\sqrt{2} - \sqrt{2}\sqrt{3}\right) & .8 = (\mathrm{Cot}(255^{o}) = 2 - \sqrt{3}) \end{bmatrix}, \ , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\mathrm{Cos}\left(\frac{\pi}{9}\right)\mathrm{Cos}\left(\frac{2\pi}{9}\right) - \mathrm{Sin}\left(\frac{\pi}{9}\right)\mathrm{Sin}\left(\frac{2\pi}{9}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{3}\right) = \frac{1}{2}\right)\right) & .2 = \left(1 - 2\,\mathrm{Sin}\left(\frac{\pi}{8}\right)^{2} = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .3 = \left(2\,\mathrm{Sin}(15^{o})\,\mathrm{Cos}(15^{o}) = \left(\mathrm{Sin}(30^{o}) = \frac{1}{2}\right)\right) & .4 = \left(\frac{2\,\mathrm{Tan}\left(\frac{\pi}{12}\right)}{1 - \mathrm{Tan}\left(\frac{\pi}{12}\right)^{2}} = \left(\mathrm{Tan}\left(\frac{\pi}{6}\right) = \mathrm{Tan}\left(\frac{\pi}{6}\right)\right)\right) \\ .5 = \left(2\,\mathrm{Cos}(22.5^{o})^{2} - 1 = \left(\mathrm{Cos}(45^{o}) = \frac{\sqrt{2}}{2}\right)\right) & .6 = \left(\mathrm{Sin}(20^{o})\,\mathrm{Cos}(25^{o}) + \mathrm{Cos}(20^{o})\,\mathrm{Sin}(25^{o}) = \left(\mathrm{Sin}(45^{o}) = \frac{\sqrt{2}}{2}\right)\right) \\ .7 = \left(\mathrm{Cos}\left(\frac{2\pi}{5}\right)\mathrm{Cos}\left(\frac{\pi}{15}\right) + \mathrm{Sin}\left(\frac{2\pi}{5}\right)\mathrm{Sin}\left(\frac{\pi}{15}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{3}\right) = \frac{1}{2}\right)\right) & .8 = \left(\frac{\mathrm{Tan}(65^{o}) - \mathrm{Tan}(20^{o})}{1 + \mathrm{Tan}(65^{o})\,\mathrm{Tan}(20^{o})} = (\mathrm{Tan}(45^{o}) = 1)\right) \\ .9 = \left(\mathrm{Cos}\left(\frac{\pi}{12}\right)^{2} - \mathrm{Sin}\left(\frac{\pi}{12}\right)^{2} = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) & .10 = \left(\mathrm{Sin}(50^{o})\,\mathrm{Cos}(20^{o}) - \mathrm{Cos}(50^{o})\,\mathrm{Sin}(20^{o}) = \left(\mathrm{Sin}(30^{o}) = \frac{1}{2}\right)\right) \end{bmatrix}, \ , \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{2\sqrt{6}}{7}\right) & .2 = \left(\mathrm{Sin}(\beta) = \frac{4}{5}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = \frac{-4}{3}\right) & .4 = \left(\mathrm{Sin}(\alpha + \beta) = -\frac{3}{7} + \frac{8\sqrt{6}}{35}\right) \\ .5 = \left(\mathrm{Cos}(\alpha - \beta) = -\frac{6\sqrt{6}}{35} + \frac{4}{7}\right) & .6 = \left(\mathrm{Tan}(\beta - \alpha) = \frac{147}{46} + \frac{125\sqrt{6}}{92}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{-7}{25}\right) & .8 = (\mathrm{Tan}(2\alpha) = -20\sqrt{6}) \end{bmatrix}, \ Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = -\frac{3\sqrt{5}}{7}\right) & .2 = \left(\mathrm{Cos}(\beta) = \frac{2\sqrt{6}}{7}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = \frac{3\sqrt{5}}{2}\right) & .4 = \left(\mathrm{Sin}(\beta - \alpha) = \frac{10}{49} + \frac{6\sqrt{6}\sqrt{5}}{49}\right) \\ .5 = \left(\mathrm{Cos}(\alpha - \beta) = -\frac{4\sqrt{6}}{49} + \frac{15\sqrt{5}}{49}\right) & .6 = \left(\mathrm{Tan}(\alpha + \beta) = -\frac{2\sqrt{5}}{7} + \frac{10\sqrt{6}}{21}\right) \\ .7 = \left(\mathrm{Cos}(2\alpha) = \frac{-41}{49}\right) & .8 = (\mathrm{Tan}(2\beta) = 20\sqrt{6}) \end{bmatrix}, \ , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Sin}(13^{o}) = (\mathrm{Sqrt}(0.0505) = 0.225)), \ , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Cos}(32^{o}) = (\mathrm{Sqrt}(0.7190) = 0.848)), \ , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Cos}\left(\frac{\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\mathrm{Sin}(105^o) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = \left(\mathrm{Tan}\left(\frac{5\pi}{12}\right) = 2 + \sqrt{3}\right) & .4 = (\mathrm{Cot}(255^o) = 2 - \sqrt{3}) \\ .5 = \left(\mathrm{Cos}\left(-\frac{11\pi}{12}\right) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .6 = (\mathrm{Sec}((-195)^o) = -\sqrt{2}\sqrt{3} + \sqrt{2}) \\ .7 = \left(\mathrm{Csc}\left(-\frac{23\pi}{12}\right) = \sqrt{2}\sqrt{3} + \sqrt{2}\right) & .8 = \left(\mathrm{Tan}\left(\frac{19\pi}{12}\right) = -2 - \sqrt{3}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = (\mathrm{Cos}(102^o)\,\mathrm{Cos}(12^o) + \mathrm{Sin}(102^o)\,\mathrm{Sin}(12^o) = (\mathrm{Cos}(90^o) = 0)) & .2 = \left(2\,\mathrm{Cos}\left(\frac{\pi}{12}\right)^2 - 1 = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .3 = \left(\mathrm{Cos}\left(\frac{\pi}{8}\right)^2 - \mathrm{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .4 = \left(\frac{\mathrm{Tan}\left(\frac{13\pi}{36}\right) - \mathrm{Tan}\left(\frac{\pi}{9}\right)}{1 + \mathrm{Tan}\left(\frac{13\pi}{36}\right)\mathrm{Tan}\left(\frac{\pi}{9}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{4}\right) = 1\right)\right) \\ .5 = \left(\frac{2\,\mathrm{Tan}(22.5^o)}{1 - \mathrm{Tan}(22.5^o)^2} = (\mathrm{Tan}(45^o) = 1)\right) & .6 = \left(1 - 2\,\mathrm{Sin}(15^o)^2 = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) \\ .7 = \left(2\,\mathrm{Sin}(22.5^o)\,\mathrm{Cos}(22.5^o) = \left(\mathrm{Sin}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .8 = \left(\mathrm{Cos}(25^o)\,\mathrm{Cos}(20^o) - \mathrm{Sin}(25^o)\,\mathrm{Sin}(20^o) = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .9 = \left(\mathrm{Sin}\left(\frac{\pi}{18}\right)\mathrm{Cos}\left(\frac{\pi}{9}\right) + \mathrm{Cos}\left(\frac{\pi}{18}\right)\mathrm{Sin}\left(\frac{\pi}{9}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) & .10 = \left(\mathrm{Sin}(70^o)\,\mathrm{Cos}(10^o) - \mathrm{Cos}(70^o)\,\mathrm{Sin}(10^o) = \left(\mathrm{Sin}(60^o) = \frac{\sqrt{3}}{2}\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \left[\left[\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\right]\right] \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{\sqrt{35}}{6}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{3\sqrt{5}}{7}\right) \\ .3 = (\mathrm{Tan}(\alpha) = \sqrt{35}) & .4 = \left(\mathrm{Sin}(\beta - \alpha) = \frac{1}{21} + \frac{\sqrt{35}\sqrt{5}}{14}\right) \\ .5 = \left(\mathrm{Cos}(\alpha - \beta) = -\frac{\sqrt{5}}{14} + \frac{\sqrt{35}}{21}\right) & .6 = \left(\mathrm{Tan}(\alpha + \beta) = -\frac{49\sqrt{5}\sqrt{7}}{95} + \frac{216\sqrt{5}}{95}\right) \\ .7 = \left(\mathrm{Cos}(2\alpha) = \frac{-17}{18}\right) & .8 = \left(\mathrm{Tan}(2\beta) = -\frac{12\sqrt{5}}{41}\right) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{\sqrt{3}}{2}\right) & .2 = \left(\mathrm{Sin}(\beta) = -\frac{\sqrt{11}}{6}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = -\frac{\sqrt{3}}{3}\right) & .4 = \left(\mathrm{Sin}(\alpha + \beta) = \frac{5}{12} - \frac{\sqrt{3}\sqrt{11}}{12}\right) \\ .5 = \left(\mathrm{Cos}(\beta - \alpha) = -\frac{5\sqrt{3}}{12} + \frac{\sqrt{11}}{12}\right) & .6 = \left(\mathrm{Tan}(\alpha - \beta) = -\frac{9\sqrt{3}}{16} - \frac{5\sqrt{11}}{16}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{7}{18}\right) & .8 = (\mathrm{Tan}(2\alpha) = -\sqrt{3}) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Sin}(24^o) = (\mathrm{Sqrt}(0.1655) = 0.407)), \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Cos}(3^o) = (\mathrm{Sqrt}(0.9975) = 0.999)), \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Cos}\left(\frac{\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\mathrm{Sin}(75^{o}) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = (\mathrm{Tan}(105^{o}) = -2 - \sqrt{3}) & .4 = \left(\mathrm{Tan}\left(\frac{19\pi}{12}\right) = -2 - \sqrt{3}\right) \\ .5 = (\mathrm{Sec}(195^{o}) = -\sqrt{2}\sqrt{3} + \sqrt{2}) & .6 = (\mathrm{Cot}((-15)^{o}) = -2 - \sqrt{3}) \\ .7 = \left(\mathrm{Sin}\left(-\frac{23\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) & .8 = \left(\mathrm{Cos}((-255)^{o}) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \end{bmatrix}, \quad \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(15^{o})^2 - \mathrm{Sin}(15^{o})^2 = \left(\mathrm{Cos}(30^{o}) = \frac{\sqrt{3}}{2}\right)\right) & .2 = \left(\frac{\mathrm{Tan}\left(\frac{7\pi}{36}\right) + \mathrm{Tan}\left(\frac{\pi}{18}\right)}{1 - \mathrm{Tan}\left(\frac{7\pi}{36}\right)\mathrm{Tan}\left(\frac{\pi}{18}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{4}\right) = 1\right)\right) \\ .3 = \left(2\,\mathrm{Sin}\left(\frac{\pi}{12}\right)\mathrm{Cos}\left(\frac{\pi}{12}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) & .4 = (\mathrm{Sin}(105^{o})\,\mathrm{Cos}(15^{o}) - \mathrm{Cos}(105^{o})\,\mathrm{Sin}(15^{o}) = (\mathrm{Sin}(90^{o}) = 1)) \\ .5 = \left(\frac{\mathrm{Tan}\left(\frac{7\pi}{30}\right) - \mathrm{Tan}\left(\frac{\pi}{15}\right)}{1 + \mathrm{Tan}\left(\frac{7\pi}{30}\right)\mathrm{Tan}\left(\frac{\pi}{15}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{3}\right)\right) & .6 = \left(\mathrm{Cos}(70^{o})\,\mathrm{Cos}(10^{o}) + \mathrm{Sin}(70^{o})\,\mathrm{Sin}(10^{o}) = \left(\mathrm{Cos}(60^{o}) = \frac{1}{2}\right)\right) \\ .7 = \left(\frac{2\,\mathrm{Tan}(22.5^{o})}{1 - \mathrm{Tan}(22.5^{o})^2} = (\mathrm{Tan}(45^{o}) = 1)\right) & .8 = \left(2\,\mathrm{Cos}\left(\frac{\pi}{8}\right)^2 - 1 = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .9 = \left(\mathrm{Cos}\left(\frac{\pi}{12}\right)\mathrm{Cos}\left(\frac{5\pi}{12}\right) - \mathrm{Sin}\left(\frac{\pi}{12}\right)\mathrm{Sin}\left(\frac{5\pi}{12}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{2}\right) = 0\right)\right) & .10 = \left(1 - 2\,\mathrm{Sin}(22.5^{o})^2 = \left(\mathrm{Cos}(45^{o}) = \frac{\sqrt{2}}{2}\right)\right) \end{bmatrix}, \quad \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \left[\left[\begin{matrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{matrix}\right]\right] \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{\sqrt{55}}{8}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{\sqrt{3}}{2}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = \frac{\sqrt{55}}{3}\right) & .4 = \left(\mathrm{Sin}(\alpha + \beta) = -\frac{\sqrt{3}\sqrt{55}}{16} + \frac{3}{16}\right) \\ .5 = \left(\mathrm{Cos}(\alpha - \beta) = -\frac{3\sqrt{3}}{16} + \frac{\sqrt{55}}{16}\right) & .6 = \left(\mathrm{Tan}(\beta - \alpha) = \frac{16\sqrt{3}}{7} + \frac{3\sqrt{55}}{7}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{1}{2}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = -\frac{3\sqrt{55}}{23}\right) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = -\frac{\sqrt{3}}{2}\right) & .2 = \left(\mathrm{Sin}(\beta) = -\frac{3\sqrt{5}}{7}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = -\frac{3\sqrt{5}}{2}\right) & .4 = \left(\mathrm{Sin}(\beta - \alpha) = \frac{1}{7} + \frac{3\sqrt{5}\sqrt{3}}{14}\right) \\ .5 = \left(\mathrm{Cos}(\alpha + \beta) = -\frac{\sqrt{3}}{7} - \frac{3\sqrt{5}}{14}\right) & .6 = \left(\mathrm{Tan}(\alpha - \beta) = -\frac{49\sqrt{3}}{33} - \frac{8\sqrt{5}}{11}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = -\frac{12\sqrt{5}}{49}\right) & .8 = (\mathrm{Tan}(2\alpha) = \sqrt{3}) \end{bmatrix}, \quad \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Sin}(33^{o}) = (\mathrm{Sqrt}(0.2965) = 0.545)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Cos}(3^{o}) = (\mathrm{Sqrt}(0.9975) = 0.999)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

TrigonometryExercise4 Answers for No.13023

$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Sin}\left(\frac{7\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\mathrm{Cos}(75^o) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .3 = \left(\mathrm{Tan}\left(\frac{\pi}{12}\right) = 2 - \sqrt{3}\right) & .4 = \left(\mathrm{Cot}\left(-\frac{7\pi}{12}\right) = 2 - \sqrt{3}\right) \\ .5 = \left(\mathrm{Sin}(285^o) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .6 = \left(\mathrm{Cos}\left(\frac{13\pi}{12}\right) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .7 = (\mathrm{Tan}(165^o) = -2 + \sqrt{3}) & .8 = (\mathrm{Sec}((-75)^o) = \sqrt{2}\sqrt{3} + \sqrt{2}) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\frac{2\,\mathrm{Tan}(15^o)}{1 - \mathrm{Tan}(15^o)^2} = \left(\mathrm{Tan}(30^o) = \frac{\sqrt{3}}{3}\right)\right) & .2 = \left(\mathrm{Cos}\left(\frac{4\pi}{9}\right)\mathrm{Cos}\left(\frac{\pi}{18}\right) - \mathrm{Sin}\left(\frac{4\pi}{9}\right)\mathrm{Sin}\left(\frac{\pi}{18}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{2}\right) = 0\right)\right) \\ .3 = \left(\frac{\mathrm{Tan}(50^o) - \mathrm{Tan}(20^o)}{1 + \mathrm{Tan}(50^o)\,\mathrm{Tan}(20^o)} = \left(\mathrm{Tan}(30^o) = \frac{\sqrt{3}}{3}\right)\right) & .4 = \left(\mathrm{Sin}(85^o)\,\mathrm{Cos}(25^o) - \mathrm{Cos}(85^o)\,\mathrm{Sin}(25^o) = \left(\mathrm{Sin}(60^o) = \frac{\sqrt{3}}{2}\right)\right) \\ .5 = \left(2\,\mathrm{Sin}\left(\frac{\pi}{8}\right)\mathrm{Cos}\left(\frac{\pi}{8}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .6 = \left(2\,\mathrm{Cos}\left(\frac{\pi}{12}\right)^2 - 1 = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .7 = \left(\mathrm{Sin}(15^o)\,\mathrm{Cos}(30^o) + \mathrm{Cos}(15^o)\,\mathrm{Sin}(30^o) = \left(\mathrm{Sin}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .8 = \left(\frac{\mathrm{Tan}\left(\frac{2\pi}{9}\right) + \mathrm{Tan}\left(\frac{\pi}{9}\right)}{1 - \mathrm{Tan}\left(\frac{2\pi}{9}\right)\mathrm{Tan}\left(\frac{\pi}{9}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{3}\right) = \sqrt{3}\right)\right) \\ .9 = \left(1 - 2\,\mathrm{Sin}(22.5^o)^2 = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .10 = \left(\mathrm{Cos}(15^o)^2 - \mathrm{Sin}(15^o)^2 = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{\sqrt{11}}{6}\right) & .2 = \left(\mathrm{Sin}(\beta) = -\frac{3\sqrt{5}}{7}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = -\frac{3\sqrt{5}}{2}\right) & .4 = \left(\mathrm{Sin}(\beta - \alpha) = -\frac{\sqrt{11}\sqrt{5}}{14} - \frac{5}{21}\right) \\ .5 = \left(\mathrm{Cos}(\alpha - \beta) = \frac{\sqrt{11}}{21} - \frac{5\sqrt{5}}{14}\right) & .6 = \left(\mathrm{Tan}(\alpha + \beta) = -\frac{245\sqrt{11}}{1081} + \frac{216\sqrt{5}}{1081}\right) \\ .7 = \left(\mathrm{Sin}(2\alpha) = \frac{5\sqrt{11}}{18}\right) & .8 = \left(\mathrm{Tan}(2\beta) = \frac{12\sqrt{5}}{41}\right) \end{bmatrix}, \quad , \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = -\frac{\sqrt{33}}{7}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{\sqrt{3}}{2}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = -\frac{\sqrt{3}}{3}\right) & .4 = \left(\mathrm{Sin}(\alpha + \beta) = \frac{\sqrt{33}\sqrt{3}}{14} - \frac{2}{7}\right) \\ .5 = \left(\mathrm{Cos}(\alpha - \beta) = \frac{2\sqrt{3}}{7} - \frac{\sqrt{33}}{14}\right) & .6 = \left(\mathrm{Tan}(\beta - \alpha) = -\frac{16\sqrt{3}\sqrt{11}}{15} - \frac{49\sqrt{3}}{15}\right) \\ .7 = \left(\mathrm{Cos}(2\alpha) = \frac{-17}{49}\right) & .8 = (\mathrm{Tan}(2\beta) = -\sqrt{3}) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Sin}(20^o) = (\mathrm{Sqrt}(0.1170) = 0.342)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Cos}(7^o) = (\mathrm{Sqrt}(0.9850) = 0.993)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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$$Ans1 = \begin{bmatrix} .1 = \left(\text{Cos}\left(\frac{7\pi}{12}\right) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\text{Sin}(75^o) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = (\text{Tan}(15^o) = 2 - \sqrt{3}) & .4 = \left(\text{Tan}\left(-\frac{13\pi}{12}\right) = -2 + \sqrt{3}\right) \\ .5 = \left(\text{Sin}(255^o) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .6 = \left(\text{Cot}\left(\frac{13\pi}{12}\right) = 2 + \sqrt{3}\right) \\ .7 = \left(\text{Cos}((-255)^o) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .8 = (\text{Csc}((-345)^o) = \sqrt{2}\sqrt{3} + \sqrt{2}) \end{bmatrix}, \; , \begin{bmatrix} \frac{:)}{:(} \\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ \frac{:)}{:(} \end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\text{Cos}\left(\frac{2\pi}{9}\right)\text{Cos}\left(\frac{\pi}{18}\right) + \text{Sin}\left(\frac{2\pi}{9}\right)\text{Sin}\left(\frac{\pi}{18}\right) = \left(\text{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) & .2 = \left(\text{Sin}(55^o)\,\text{Cos}(10^o) - \text{Cos}(55^o)\,\text{Sin}(10^o) = \left(\text{Sin}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .3 = \left(\frac{\text{Tan}(85^o) - \text{Tan}(25^o)}{1 + \text{Tan}(85^o)\,\text{Tan}(25^o)} = (\text{Tan}(60^o) = \sqrt{3})\right) & .4 = \left(2\,\text{Sin}(22.5^o)\,\text{Cos}(22.5^o) = \left(\text{Sin}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .5 = \left(1 - 2\,\text{Sin}(15^o)^2 = \left(\text{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) & .6 = \left(\text{Cos}\left(\frac{\pi}{8}\right)^2 - \text{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\text{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .7 = \left(\text{Sin}\left(\frac{\pi}{18}\right)\text{Cos}\left(\frac{\pi}{9}\right) + \text{Cos}\left(\frac{\pi}{18}\right)\text{Sin}\left(\frac{\pi}{9}\right) = \left(\text{Sin}\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) & .8 = \left(\text{Cos}(50^o)\,\text{Cos}(10^o) - \text{Sin}(50^o)\,\text{Sin}(10^o) = \left(\text{Cos}(60^o) = \frac{1}{2}\right)\right) \\ .9 = \left(2\,\text{Cos}\left(\frac{\pi}{12}\right)^2 - 1 = \left(\text{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) & .10 = \left(\frac{2\,\text{Tan}(22.5^o)}{1 - \text{Tan}(22.5^o)^2} = (\text{Tan}(45^o) = 1)\right) \end{bmatrix}, \; , \begin{bmatrix} \frac{:)}{:(} \\ \frac{:)}{:(} \\ \left[\left[\begin{matrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{matrix}\right]\right] \\ \frac{:)}{:(} \\ \frac{:)}{:(} \\ \frac{:)}{:(} \end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\text{Cos}(\alpha) = \frac{2\sqrt{14}}{9}\right) & .2 = \left(\text{Sin}(\beta) = \frac{2\sqrt{2}}{3}\right) \\ .3 = (\text{Tan}(\beta) = -2\sqrt{2}) & .4 = \left(\text{Sin}(\alpha - \beta) = -\frac{5}{27} - \frac{4\sqrt{2}\sqrt{14}}{27}\right) \\ .5 = \left(\text{Cos}(\alpha + \beta) = -\frac{2\sqrt{14}}{27} - \frac{10\sqrt{2}}{27}\right) & .6 = \left(\text{Tan}(\beta - \alpha) = \frac{9\sqrt{2}}{8} + \frac{5\sqrt{2}\sqrt{7}}{8}\right) \\ .7 = \left(\text{Cos}(2\alpha) = \frac{31}{81}\right) & .8 = \left(\text{Tan}(2\beta) = \frac{4\sqrt{2}}{7}\right) \end{bmatrix}, \; , \; Ans4 = \begin{bmatrix} .1 = \left(\text{Cos}(\alpha) = \frac{-4}{5}\right) & .2 = \left(\text{Sin}(\beta) = -\frac{2\sqrt{10}}{7}\right) \\ .3 = \left(\text{Tan}(\beta) = -\frac{2\sqrt{10}}{3}\right) & .4 = \left(\text{Sin}(\alpha + \beta) = -\frac{9}{35} + \frac{8\sqrt{10}}{35}\right) \\ .5 = \left(\text{Cos}(\beta - \alpha) = -\frac{12}{35} + \frac{6\sqrt{10}}{35}\right) & .6 = \left(\text{Tan}(\alpha - \beta) = -\frac{49}{18} - \frac{25\sqrt{10}}{36}\right) \\ .7 = \left(\text{Sin}(2\alpha) = \frac{24}{25}\right) & .8 = \left(\text{Tan}(2\beta) = \frac{12\sqrt{10}}{31}\right) \end{bmatrix}, \; , \begin{bmatrix} \frac{:)}{:(} \\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ \frac{:)}{:(} \end{bmatrix}$$

$$Ans5 = (\text{Cos}(11^o) = (\text{Sqrt}(0.9635) = 0.982)), \; , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\text{Sin}(34^o) = (\text{Sqrt}(0.3125) = 0.559)), \; , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

TrigonometryExercise4 Answers for No.13197

$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(105^o) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\mathrm{Sin}\left(\frac{5\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = (\mathrm{Tan}(15^o) = 2 - \sqrt{3}) & .4 = (\mathrm{Cot}((-285)^o) = 2 - \sqrt{3}) \\ .5 = \left(\mathrm{Cos}\left(-\frac{7\pi}{12}\right) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .6 = (\mathrm{Csc}((-195)^o) = \sqrt{2}\sqrt{3} + \sqrt{2}) \\ .7 = \left(\mathrm{Sin}\left(\frac{17\pi}{12}\right) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .8 = \left(\mathrm{Tan}\left(\frac{23\pi}{12}\right) = -2 + \sqrt{3}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(2\,\mathrm{Cos}\left(\frac{\pi}{12}\right)^2 - 1 = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) & .2 = \left(\mathrm{Cos}\left(\frac{\pi}{8}\right)^2 - \mathrm{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .3 = \left(\frac{\mathrm{Tan}\left(\frac{4\pi}{9}\right) - \mathrm{Tan}\left(\frac{\pi}{9}\right)}{1 + \mathrm{Tan}\left(\frac{4\pi}{9}\right)\mathrm{Tan}\left(\frac{\pi}{9}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{3}\right) = \sqrt{3}\right)\right) & .4 = \left(\frac{2\,\mathrm{Tan}(15^o)}{1 - \mathrm{Tan}(15^o)^2} = \left(\mathrm{Tan}(30^o) = \frac{\sqrt{3}}{3}\right)\right) \\ .5 = \left(1 - 2\,\mathrm{Sin}(22.5^o)^2 = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .6 = \left(2\,\mathrm{Sin}(15^o)\,\mathrm{Cos}(15^o) = \left(\mathrm{Sin}(30^o) = \frac{1}{2}\right)\right) \\ .7 = \left(\mathrm{Cos}(12^o)\,\mathrm{Cos}(33^o) - \mathrm{Sin}(12^o)\,\mathrm{Sin}(33^o) = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .8 = \left(\frac{\mathrm{Tan}(10^o) + \mathrm{Tan}(20^o)}{1 - \mathrm{Tan}(10^o)\,\mathrm{Tan}(20^o)} = \left(\mathrm{Tan}(30^o) = \frac{\sqrt{3}}{3}\right)\right) \\ .9 = \left(\mathrm{Cos}(65^o)\,\mathrm{Cos}(20^o) + \mathrm{Sin}(65^o)\,\mathrm{Sin}(20^o) = \left(\mathrm{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .10 = \left(\mathrm{Sin}\left(\frac{5\pi}{12}\right)\mathrm{Cos}\left(\frac{\pi}{12}\right) + \mathrm{Cos}\left(\frac{5\pi}{12}\right)\mathrm{Sin}\left(\frac{\pi}{12}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{2}\right) = 1\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{\sqrt{11}}{6}\right) & .2 = \left(\mathrm{Sin}(\beta) = -\frac{\sqrt{33}}{7}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = \frac{5\sqrt{11}}{11}\right) & .4 = \left(\mathrm{Sin}(\alpha+\beta) = \frac{10}{21} - \frac{\sqrt{11}\sqrt{33}}{42}\right) \\ .5 = \left(\mathrm{Cos}(\beta-\alpha) = \frac{2\sqrt{11}}{21} - \frac{5\sqrt{33}}{42}\right) & .6 = \left(\mathrm{Tan}(\alpha-\beta) = -\frac{245\sqrt{11}}{649} - \frac{144\sqrt{3}\sqrt{11}}{649}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = -\frac{8\sqrt{33}}{49}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = -\frac{5\sqrt{11}}{7}\right) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = -\frac{\sqrt{39}}{8}\right) & .2 = \left(\mathrm{Cos}(\beta) = -\frac{3\sqrt{5}}{7}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = -\frac{2\sqrt{5}}{15}\right) & .4 = \left(\mathrm{Sin}(\beta-\alpha) = -\frac{5}{28} - \frac{3\sqrt{39}\sqrt{5}}{56}\right) \\ .5 = \left(\mathrm{Cos}(\alpha-\beta) = \frac{15\sqrt{5}}{56} - \frac{\sqrt{39}}{28}\right) & .6 = \left(\mathrm{Tan}(\alpha+\beta) = \frac{245\sqrt{39}}{969} - \frac{128\sqrt{5}}{323}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{41}{49}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = -\frac{5\sqrt{39}}{7}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Cos}(3^o) = (\mathrm{Sqrt}(0.9975) = 0.999)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Sin}(19^o) = (\mathrm{Sqrt}(0.1060) = 0.326)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans1 = \begin{bmatrix} .1 = \left(\cos\left(\frac{\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\sin(105^o) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = \left(\tan\left(\frac{5\pi}{12}\right) = 2 + \sqrt{3}\right) & .4 = \left(\sec\left(-\frac{13\pi}{12}\right) = -\sqrt{2}\sqrt{3} + \sqrt{2}\right) \\ .5 = (\csc((-165)^o) = -\sqrt{2} - \sqrt{2}\sqrt{3}) & .6 = \left(\sin\left(-\frac{23\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .7 = (\cot(345^o) = -2 - \sqrt{3}) & .8 = \left(\cos\left(\frac{11\pi}{12}\right) = -\frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \end{bmatrix}, \ , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\cos\left(\frac{11\pi}{60}\right)\cos\left(\frac{\pi}{15}\right) - \sin\left(\frac{11\pi}{60}\right)\sin\left(\frac{\pi}{15}\right) = \left(\cos\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .2 = \left(\cos(22.5^o)^2 - \sin(22.5^o)^2 = \left(\cos(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .3 = \left(1 - 2\sin\left(\frac{\pi}{8}\right)^2 = \left(\cos\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .4 = \left(\frac{2\tan(22.5^o)}{1 - \tan(22.5^o)^2} = (\tan(45^o) = 1)\right) \\ .5 = \left(2\cos(15^o)^2 - 1 = \left(\cos(30^o) = \frac{\sqrt{3}}{2}\right)\right) & .6 = \left(2\sin\left(\frac{\pi}{12}\right)\cos\left(\frac{\pi}{12}\right) = \left(\sin\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) \\ .7 = \left(\frac{\tan\left(\frac{5\pi}{36}\right) + \tan\left(\frac{7\pi}{36}\right)}{1 - \tan\left(\frac{5\pi}{36}\right)\tan\left(\frac{7\pi}{36}\right)} = \left(\tan\left(\frac{\pi}{3}\right) = \sqrt{3}\right)\right) & .8 = (\sin(12^o)\cos(78^o) + \cos(12^o)\sin(78^o) = (\sin(90^o) = 1)) \\ .9 = \left(\frac{\tan(35^o) - \tan(5^o)}{1 + \tan(35^o)\tan(5^o)} = \left(\tan(30^o) = \frac{\sqrt{3}}{3}\right)\right) & .10 = (\sin(110^o)\cos(20^o) - \cos(110^o)\sin(20^o) = (\sin(90^o) = 1)) \end{bmatrix}, \ , \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\cos(\alpha) = \frac{\sqrt{3}}{2}\right) & .2 = \left(\sin(\beta) = \frac{\sqrt{35}}{6}\right) \\ .3 = (\tan(\beta) = -\sqrt{35}) & .4 = \left(\sin(\alpha + \beta) = -\frac{1}{12} + \frac{\sqrt{35}\sqrt{3}}{12}\right) \\ .5 = \left(\cos(\alpha - \beta) = -\frac{\sqrt{3}}{12} + \frac{\sqrt{35}}{12}\right) & .6 = \left(\tan(\beta - \alpha) = \frac{\sqrt{35}}{8} + \frac{9\sqrt{3}}{8}\right) \\ .7 = \left(\cos(2\alpha) = \frac{1}{2}\right) & .8 = \left(\tan(2\beta) = \frac{\sqrt{35}}{17}\right) \end{bmatrix}, \ , Ans4 = \begin{bmatrix} .1 = \left(\sin(\alpha) = -\frac{\sqrt{65}}{9}\right) & .2 = \left(\cos(\beta) = \frac{-4}{5}\right) \\ .3 = \left(\tan(\alpha) = -\frac{\sqrt{65}}{4}\right) & .4 = \left(\sin(\beta - \alpha) = -\frac{4}{15} - \frac{4\sqrt{65}}{45}\right) \\ .5 = \left(\cos(\alpha + \beta) = -\frac{16}{45} - \frac{\sqrt{65}}{15}\right) & .6 = \left(\tan(\alpha - \beta) = \frac{100\sqrt{65}}{329} + \frac{972}{329}\right) \\ .7 = \left(\cos(2\beta) = \frac{7}{25}\right) & .8 = \left(\tan(2\alpha) = \frac{8\sqrt{65}}{49}\right) \end{bmatrix}, \ , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\cos(37^o) = (\mathrm{Sqrt}(0.6380) = 0.799)), \ , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\sin(4^o) = (\mathrm{Sqrt}(0.0050) = 0.070)), \ , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans1 = \begin{bmatrix} .1 = \left(\mathrm{Sin}\left(\frac{7\pi}{12}\right) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\mathrm{Cos}(15^o) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = \left(\mathrm{Tan}\left(\frac{5\pi}{12}\right) = 2 + \sqrt{3}\right) & .4 = \left(\mathrm{Csc}((-165)^o) = -\sqrt{2} - \sqrt{2}\sqrt{3}\right) \\ .5 = \left(\mathrm{Cos}\left(-\frac{17\pi}{12}\right) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) & .6 = \left(\mathrm{Sin}((-345)^o) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .7 = \left(\mathrm{Cot}\left(-\frac{13\pi}{12}\right) = -2 - \sqrt{3}\right) & .8 = \left(\mathrm{Sec}\left(-\frac{5\pi}{12}\right) = \sqrt{2}\sqrt{3} + \sqrt{2}\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = (\mathrm{Cos}(12^o)\,\mathrm{Cos}(78^o) - \mathrm{Sin}(12^o)\,\mathrm{Sin}(78^o) = (\mathrm{Cos}(90^o) = 0)) & .2 = \left(\left(1 - 2\,\mathrm{Sin}\left(\frac{\pi}{12}\right)^2\right) = \left(\mathrm{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .3 = \left(\mathrm{Cos}\left(\frac{11\pi}{36}\right)\mathrm{Cos}\left(\frac{\pi}{18}\right) + \mathrm{Sin}\left(\frac{11\pi}{36}\right)\mathrm{Sin}\left(\frac{\pi}{18}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .4 = \left(2\,\mathrm{Cos}(15^o)^2 - 1 = \left(\mathrm{Cos}(30^o) = \frac{\sqrt{3}}{2}\right)\right) \\ .5 = \left(\mathrm{Sin}\left(\frac{\pi}{6}\right)\mathrm{Cos}\left(\frac{\pi}{12}\right) + \mathrm{Cos}\left(\frac{\pi}{6}\right)\mathrm{Sin}\left(\frac{\pi}{12}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .6 = \left(\frac{2\,\mathrm{Tan}(22.5^o)}{1 - \mathrm{Tan}(22.5^o)^2} = (\mathrm{Tan}(45^o) = 1)\right) \\ .7 = \left(2\,\mathrm{Sin}(22.5^o)\,\mathrm{Cos}(22.5^o) = \left(\mathrm{Sin}(45^o) = \frac{\sqrt{2}}{2}\right)\right) & .8 = \left(\mathrm{Cos}\left(\frac{\pi}{8}\right)^2 - \mathrm{Sin}\left(\frac{\pi}{8}\right)^2 = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .9 = \left(\mathrm{Sin}(72^o)\,\mathrm{Cos}(12^o) - \mathrm{Cos}(72^o)\,\mathrm{Sin}(12^o) = \left(\mathrm{Sin}(60^o) = \frac{\sqrt{3}}{2}\right)\right) & .10 = \left(\frac{\mathrm{Tan}(40^o) - \mathrm{Tan}(10^o)}{1 + \mathrm{Tan}(40^o)\,\mathrm{Tan}(10^o)} = \left(\mathrm{Tan}(30^o) = \frac{\sqrt{3}}{3}\right)\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{\sqrt{15}}{4}\right) & .2 = \left(\mathrm{Sin}(\beta) = -\frac{\sqrt{65}}{9}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = \frac{\sqrt{65}}{4}\right) & .4 = \left(\mathrm{Sin}(\alpha - \beta) = -\frac{1}{9} + \frac{\sqrt{15}\sqrt{65}}{36}\right) \\ .5 = \left(\mathrm{Cos}(\alpha + \beta) = -\frac{\sqrt{15}}{9} + \frac{\sqrt{65}}{36}\right) & .6 = \left(\mathrm{Tan}(\beta - \alpha) = \frac{64\sqrt{13}\sqrt{5}}{175} - \frac{81\sqrt{5}\sqrt{3}}{175}\right) \\ .7 = \left(\mathrm{Sin}(2\beta) = \frac{8\sqrt{65}}{81}\right) & .8 = \left(\mathrm{Tan}(2\alpha) = \frac{\sqrt{15}}{7}\right) \end{bmatrix}, \quad , \quad Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = \frac{\sqrt{15}}{4}\right) & .2 = \left(\mathrm{Cos}(\beta) = \frac{3}{5}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = \frac{-4}{3}\right) & .4 = \left(\mathrm{Sin}(\beta - \alpha) = \frac{1}{5} - \frac{3\sqrt{15}}{20}\right) \\ .5 = \left(\mathrm{Cos}(\alpha + \beta) = -\frac{3}{20} + \frac{\sqrt{15}}{5}\right) & .6 = \left(\mathrm{Tan}(\alpha - \beta) = \frac{25\sqrt{15}}{231} - \frac{64}{77}\right) \\ .7 = \left(\mathrm{Sin}(2\alpha) = -\frac{\sqrt{15}}{8}\right) & .8 = \left(\mathrm{Tan}(2\beta) = \frac{24}{7}\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Cos}(32^o) = (\mathrm{Sqrt}(0.7190) = 0.848)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Sin}(13^o) = (\mathrm{Sqrt}(0.0505) = 0.225)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans1 = \begin{bmatrix} .1 = \left(\text{Sin}(75^o) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) & .2 = \left(\text{Cos}\left(\frac{7\pi}{12}\right) = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .3 = \left(\text{Tan}\left(\frac{\pi}{12}\right) = 2 - \sqrt{3}\right) & .4 = (\text{Cot}((-15)^o) = -2 - \sqrt{3}) \\ .5 = \left(\text{Sec}\left(-\frac{17\pi}{12}\right) = -\sqrt{2} - \sqrt{2}\sqrt{3}\right) & .6 = \left(\text{Cos}(345^o) = \frac{\sqrt{2}}{4} + \frac{\sqrt{2}\sqrt{3}}{4}\right) \\ .7 = \left(\text{Csc}\left(-\frac{23\pi}{12}\right) = \sqrt{2}\sqrt{3} + \sqrt{2}\right) & .8 = \left(\text{Sin}(165^o) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(2\,\text{Sin}(15^o)\,\text{Cos}(15^o) = \left(\text{Sin}(30^o) = \frac{1}{2}\right)\right) & .2 = \left(1 - 2\,\text{Sin}(22.5^o)^2 = \left(\text{Cos}(45^o) = \frac{\sqrt{2}}{2}\right)\right) \\ .3 = \left(\text{Cos}\left(\frac{\pi}{3}\right)\text{Cos}\left(\frac{\pi}{12}\right) + \text{Sin}\left(\frac{\pi}{3}\right)\text{Sin}\left(\frac{\pi}{12}\right) = \left(\text{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .4 = \left(2\,\text{Cos}\left(\frac{\pi}{8}\right)^2 - 1 = \left(\text{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) \\ .5 = \left(\frac{\text{Tan}(42^o) - \text{Tan}(12^o)}{1 + \text{Tan}(42^o)\,\text{Tan}(12^o)} = \left(\text{Tan}(30^o) = \frac{\sqrt{3}}{3}\right)\right) & .6 = (\text{Sin}(15^o)\,\text{Cos}(75^o) + \text{Cos}(15^o)\,\text{Sin}(75^o) = (\text{Sin}(90^o) = 1)) \\ .7 = \left(\text{Cos}\left(\frac{\pi}{15}\right)\text{Cos}\left(\frac{4\pi}{15}\right) - \text{Sin}\left(\frac{\pi}{15}\right)\text{Sin}\left(\frac{4\pi}{15}\right) = \left(\text{Cos}\left(\frac{\pi}{3}\right) = \frac{1}{2}\right)\right) & .8 = \left(\text{Cos}\left(\frac{\pi}{12}\right)^2 - \text{Sin}\left(\frac{\pi}{12}\right)^2 = \left(\text{Cos}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}\right)\right) \\ .9 = \left(\frac{2\,\text{Tan}(22.5^o)}{1 - \text{Tan}(22.5^o)^2} = (\text{Tan}(45^o) = 1)\right) & .10 = \left(\text{Sin}(70^o)\,\text{Cos}(10^o) - \text{Cos}(70^o)\,\text{Sin}(10^o) = \left(\text{Sin}(60^o) = \frac{\sqrt{3}}{2}\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\text{Sin}(\alpha) = \frac{2\sqrt{2}}{3}\right) & .2 = \left(\text{Cos}(\beta) = -\frac{3\sqrt{5}}{7}\right) \\ .3 = (\text{Tan}(\alpha) = 2\sqrt{2}) & .4 = \left(\text{Sin}(\beta - \alpha) = -\frac{2}{21} + \frac{2\sqrt{2}\sqrt{5}}{7}\right) \\ .5 = \left(\text{Cos}(\alpha - \beta) = -\frac{\sqrt{5}}{7} - \frac{4\sqrt{2}}{21}\right) & .6 = \left(\text{Tan}(\alpha + \beta) = \frac{98\sqrt{2}}{13} + \frac{54\sqrt{5}}{13}\right) \\ .7 = \left(\text{Cos}(2\beta) = \frac{41}{49}\right) & .8 = \left(\text{Tan}(2\alpha) = -\frac{4\sqrt{2}}{7}\right) \end{bmatrix}, \quad Ans4 = \begin{bmatrix} .1 = \left(\text{Sin}(\alpha) = -\frac{\sqrt{33}}{7}\right) & .2 = \left(\text{Cos}(\beta) = -\frac{\sqrt{11}}{6}\right) \\ .3 = \left(\text{Tan}(\alpha) = -\frac{\sqrt{33}}{4}\right) & .4 = \left(\text{Sin}(\alpha - \beta) = \frac{\sqrt{11}\sqrt{33}}{42} - \frac{10}{21}\right) \\ .5 = \left(\text{Cos}(\beta - \alpha) = -\frac{2\sqrt{11}}{21} - \frac{5\sqrt{33}}{42}\right) & .6 = \left(\text{Tan}(\alpha + \beta) = \frac{245\sqrt{11}}{649} + \frac{144\sqrt{3}\sqrt{11}}{649}\right) \\ .7 = \left(\text{Cos}(2\beta) = \frac{-7}{18}\right) & .8 = \left(\text{Tan}(2\alpha) = \frac{8\sqrt{33}}{17}\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\text{Cos}(20^o) = (\text{Sqrt}(0.8830) = 0.940)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\text{Sin}(36^o) = (\text{Sqrt}(0.3455) = 0.588)), \quad \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans1 = \begin{bmatrix} .1 = \left(\text{Cos}(75^{o}) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) & .2 = \left(\text{Sin}\left(\frac{\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .3 = (\text{Tan}(105^{o}) = -2 - \sqrt{3}) & .4 = (\text{Csc}(165^{o}) = \sqrt{2}\sqrt{3} + \sqrt{2}) \\ .5 = \left(\text{Tan}\left(\frac{17\pi}{12}\right) = 2 + \sqrt{3}\right) & .6 = \left(\text{Cos}((-285)^{o}) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \\ .7 = \left(\text{Sec}\left(\frac{13\pi}{12}\right) = -\sqrt{2}\sqrt{3} + \sqrt{2}\right) & .8 = \left(\text{Sin}\left(-\frac{23\pi}{12}\right) = \frac{\sqrt{2}\sqrt{3}}{4} - \frac{\sqrt{2}}{4}\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans2 = \begin{bmatrix} .1 = \left(\text{Sin}\left(\frac{4\pi}{9}\right)\text{Cos}\left(\frac{\pi}{18}\right) + \text{Cos}\left(\frac{4\pi}{9}\right)\text{Sin}\left(\frac{\pi}{18}\right) = \left(\text{Sin}\left(\frac{\pi}{2}\right) = 1\right)\right) & .2 = \left(2\,\text{Sin}\left(\frac{\pi}{12}\right)\text{Cos}\left(\frac{\pi}{12}\right) = \left(\text{Sin}\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) \\ .3 = \left(\text{Cos}\left(\frac{2\pi}{5}\right)\text{Cos}\left(\frac{\pi}{15}\right) + \text{Sin}\left(\frac{2\pi}{5}\right)\text{Sin}\left(\frac{\pi}{15}\right) = \left(\text{Cos}\left(\frac{\pi}{3}\right) = \frac{1}{2}\right)\right) & .4 = \left(\frac{2\,\text{Tan}(15^{o})}{1 - \text{Tan}(15^{o})^{2}} = \left(\text{Tan}(30^{o}) = \frac{\sqrt{3}}{3}\right)\right) \\ .5 = \left(1 - 2\,\text{Sin}\left(\frac{\pi}{8}\right)^{2} = \left(\text{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .6 = \left(\text{Cos}(15^{o})\,\text{Cos}(30^{o}) - \text{Sin}(15^{o})\,\text{Sin}(30^{o}) = \left(\text{Cos}(45^{o}) = \frac{\sqrt{2}}{2}\right)\right) \\ .7 = \left(\frac{\text{Tan}(20^{o}) + \text{Tan}(40^{o})}{1 - \text{Tan}(20^{o})\,\text{Tan}(40^{o})} = (\text{Tan}(60^{o}) = \sqrt{3})\right) & .8 = \left(2\,\text{Cos}(22.5^{o})^{2} - 1 = \left(\text{Cos}(45^{o}) = \frac{\sqrt{2}}{2}\right)\right) \\ .9 = \left(\frac{\text{Tan}(35^{o}) - \text{Tan}(5^{o})}{1 + \text{Tan}(35^{o})\,\text{Tan}(5^{o})} = \left(\text{Tan}(30^{o}) = \frac{\sqrt{3}}{3}\right)\right) & .10 = \left(\text{Cos}(15^{o})^{2} - \text{Sin}(15^{o})^{2} = \left(\text{Cos}(30^{o}) = \frac{\sqrt{3}}{2}\right)\right) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\text{Sin}(\alpha) = \frac{2\sqrt{14}}{9}\right) & .2 = \left(\text{Cos}(\beta) = -\frac{\sqrt{3}}{2}\right) \\ .3 = \left(\text{Tan}(\beta) = \frac{\sqrt{3}}{3}\right) & .4 = \left(\text{Sin}(\alpha - \beta) = -\frac{\sqrt{3}\sqrt{14}}{9} + \frac{5}{18}\right) \\ .5 = \left(\text{Cos}(\beta - \alpha) = -\frac{5\sqrt{3}}{18} - \frac{\sqrt{14}}{9}\right) & .6 = \left(\text{Tan}(\alpha + \beta) = \frac{81\sqrt{3}}{19} + \frac{40\sqrt{14}}{19}\right) \\ .7 = \left(\text{Cos}(2\alpha) = \frac{-31}{81}\right) & .8 = (\text{Tan}(2\beta) = \sqrt{3}) \end{bmatrix}, \quad , \quad Ans4 = \begin{bmatrix} .1 = \left(\text{Cos}(\alpha) = \frac{\sqrt{65}}{9}\right) & .2 = \left(\text{Sin}(\beta) = \frac{\sqrt{7}}{4}\right) \\ .3 = \left(\text{Tan}(\alpha) = -\frac{4\sqrt{65}}{65}\right) & .4 = \left(\text{Sin}(\alpha - \beta) = \frac{1}{3} - \frac{\sqrt{65}\sqrt{7}}{36}\right) \\ .5 = \left(\text{Cos}(\alpha + \beta) = -\frac{\sqrt{65}}{12} + \frac{\sqrt{7}}{9}\right) & .6 = \left(\text{Tan}(\beta - \alpha) = -\frac{243\sqrt{7}}{473} + \frac{64\sqrt{65}}{473}\right) \\ .7 = \left(\text{Cos}(2\alpha) = \frac{49}{81}\right) & .8 = (\text{Tan}(2\beta) = -3\sqrt{7}) \end{bmatrix}, \quad , \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\text{Cos}(42^{o}) = (\text{Sqrt}(0.5525) = 0.743)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\text{Sin}(10^{o}) = (\text{Sqrt}(0.0300) = 0.174)), \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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