ชื่อ-นามสกุล .....

เลขประจำตัว No.1

แบบฝึกหัดเรื่อง ตรีโกณมิติ

1. จงหาค่าของ

1.1) $\cos\left(\frac{\pi}{12}\right)$ =

$\cos\left(\frac{\pi}{3}-\frac{\pi}{4}\right) = \cos\left(\frac{\pi}{3}\right)\cos\left(\frac{\pi}{4}\right)+\sin\left(\frac{\pi}{3}\right)\sin\left(\frac{\pi}{4}\right)$

$= \frac{1}{2}\left(\frac{\sqrt{2}}{2}\right)+\frac{\sqrt{3}}{2}\left(\frac{\sqrt{2}}{2}\right)$

$= \frac{\sqrt{2}}{4}+\frac{\sqrt{2}\cdot\sqrt{3}}{4}$ หรือ $\frac{\sqrt{2}+\sqrt{6}}{4}$

1.2) $\sin(75^\circ)$ =

$\sin(30^\circ+45^\circ) = \sin(30^\circ)\cdot\cos(45^\circ)+\cos(30^\circ)\sin(45^\circ)$

$= \frac{1}{2}\left(\frac{\sqrt{2}}{2}\right)+\frac{\sqrt{3}}{2}\left(\frac{\sqrt{2}}{2}\right)$

$= \frac{\sqrt{2}}{4}+\frac{\sqrt{2}\sqrt{3}}{4}$ หรือ $\frac{\sqrt{2}+\sqrt{6}}{4}$

1.3) $\tan(105^\circ)$ =

$\tan(45^\circ+60^\circ) = \frac{\tan(45^\circ)+\tan(60^\circ)}{1-\tan(45^\circ)\cdot\tan(60^\circ)}$

$= \frac{1+\sqrt{3}}{1-\sqrt{3}}$ หรือ $-2-\sqrt{3}$

1.4) $\sec\left(\frac{13\pi}{12}\right)$ =

$\because \sec(A) = \frac{1}{\cos(A)}$

$\cos\left(\frac{13\pi}{12}\right) = \cos\left(\pi+\frac{\pi}{12}\right) = \cos\pi\cdot\cos\frac{\pi}{12}-\sin\pi\cdot\sin\frac{\pi}{12}$

$= (-1)\cdot\cos\frac{\pi}{12} = (-1)\cdot\cos\left(\frac{\pi}{3}-\frac{\pi}{4}\right) = (-1)\left(\frac{\sqrt{2}+\sqrt{6}}{4}\right)$

$\sec\left(\frac{13\pi}{12}\right) = \frac{-4}{\sqrt{2}+\sqrt{6}} = \sqrt{2}-\sqrt{6}$

1.5) $\cot(-285^\circ) = \frac{1}{\tan(-285^\circ)}$

$\tan(-285^\circ) = \tan(75^\circ+(-360^\circ)) = \frac{\tan(75^\circ)+\tan(-360^\circ)}{1-\tan(75^\circ)\tan(-360^\circ)}$

$= \tan(75^\circ) = \frac{\sin(75^\circ)}{\cos(75^\circ)}$

$= \frac{\sqrt{6}+\sqrt{2}}{\sqrt{6}-\sqrt{2}} = 2+\sqrt{3}$

ดังนั้น $\cot(-285^\circ) = \frac{1}{2+\sqrt{3}} = 2-\sqrt{3}$

1.6) $\cos(345^\circ)$ =

$\cos(75^\circ+270^\circ) = \cos(75^\circ)\cdot\cos(270^\circ)-\sin(75^\circ)\sin(270^\circ)$

$= -(-1)\sin(75^\circ)$

$= \frac{\sqrt{2}+\sqrt{6}}{4}$

1.7) $\csc\left(\frac{-5\pi}{12}\right) = \frac{1}{\sin\left(\frac{-5\pi}{12}\right)}$

$\sin\left(\frac{-5\pi}{12}\right) = \sin\left(\frac{\pi}{12}-\frac{\pi}{2}\right)$

$= \sin\frac{\pi}{12}\cos\frac{\pi}{2}-\cos\frac{\pi}{12}\cdot\sin\frac{\pi}{2} = -\cos\left(\frac{\pi}{12}\right)$

$= -\frac{(\sqrt{2}+\sqrt{6})}{4}$

ดังนั้น $\csc\left(\frac{-5\pi}{12}\right) = -\frac{4}{\sqrt{2}+\sqrt{6}} = \sqrt{2}-\sqrt{6}$

1.8) $\tan\left(\frac{17\pi}{12}\right)$ =

$\tan\left(\frac{17\pi}{12}\right) = \tan\left(\frac{15\pi}{12}+\frac{2\pi}{12}\right) = \tan\left(\frac{5\pi}{4}+\frac{\pi}{6}\right)$

$= \frac{\tan\frac{5\pi}{4}+\tan\frac{\pi}{6}}{1-\tan\frac{5\pi}{4}\cdot\tan\frac{\pi}{6}} = \frac{1+\sqrt{3}}{-1+\sqrt{3}}$

$= 2+\sqrt{3}$

2. จงหาค่าของ

2.1) $\dfrac{\tan(\frac{\pi}{36})+\tan(\frac{5\pi}{36})}{1-\tan(\frac{\pi}{36})\tan(\frac{5\pi}{36})}$ =

$\tan\left(\frac{\pi}{36}+\frac{5\pi}{36}\right)=\tan\left(\frac{6\pi}{36}\right)=\tan\left(\frac{\pi}{6}\right)=\frac{1}{\sqrt{3}}$

$=\boxed{\frac{\sqrt{3}}{3}}$

2.2) $\cos(35^\circ)\cos(10^\circ)-\sin(35)\sin(10)=$

$\cos(35^\circ+10^\circ)=\cos(45^\circ)$

$=\boxed{\frac{\sqrt{2}}{2}}$

2.3) $\dfrac{\tan(50^\circ)-\tan(20^\circ)}{1+\tan(50^\circ)\tan(20^\circ)}$ =

$\tan(50^\circ-20^\circ)=\tan(30^\circ)=\frac{1}{\sqrt{3}}$

$=\boxed{\frac{\sqrt{3}}{3}}$

2.4) $\sin(85^\circ)\cos(25^\circ)-\cos(85^\circ)\sin(25^\circ)$ =

$\sin(85^\circ-25^\circ)=\sin(60^\circ)$

$=\boxed{\frac{\sqrt{3}}{2}}$

2.5) $\cos\left(\frac{5\pi}{9}\right)\cos\left(\frac{\pi}{18}\right)+\sin\left(\frac{5\pi}{9}\right)\sin\left(\frac{\pi}{18}\right)$ =

$\cos\left(\frac{5\pi}{9}-\frac{\pi}{18}\right)=\cos\left(\frac{\pi}{2}\right)=\boxed{0}$

2.6) $\dfrac{2\tan(15^\circ)}{1-\tan(15^\circ)^2}$ =

$\tan(2(15^\circ))=\tan(30^\circ)$

$=\tan\left(\frac{\pi}{6}\right)=\frac{1}{\sqrt{3}}$

$=\boxed{\frac{\sqrt{3}}{3}}$

2.7) $2\cos\left(\frac{\pi}{8}\right)^2-1$ =

$\cos\left(2\left(\frac{\pi}{8}\right)\right)=\cos\left(\frac{\pi}{4}\right)$

$=\boxed{\frac{\sqrt{2}}{2}}$

2.8) $1-2\sin(22.5)^2$ =

$\cos(2(22.5))=\cos(45^\circ)$

$=\boxed{\frac{\sqrt{2}}{2}}$

2.9) $\cos(15^\circ)^2-\sin(15^\circ)^2$ =

$\cos(2(15^\circ))=\cos(30^\circ)$

$=\boxed{\frac{\sqrt{3}}{2}}$

2.10) $2\sin\left(\frac{\pi}{12}\right)\cos\left(\frac{\pi}{12}\right)$ =

$\sin\left(2\left(\frac{\pi}{12}\right)\right)=\sin\left(\frac{\pi}{6}\right)$

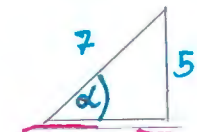
$=\boxed{\frac{1}{2}}$

3. กำหนด $A =$ 0 , $B =$ $\frac{\pi}{2}$, $C =$ $\frac{\pi}{2}$, $D =$ π $\frac{\pi}{2} \le \beta \le \pi$ อยู่ Q_2

ถ้า $Con1 =$ $\sin(\alpha) = \frac{5}{7}$, $A \le \alpha \le B$ และ $Con2 =$ $\cos(\beta) = \frac{-2}{7}$, $C \le \beta \le D$ จงหา

$0 \le \alpha \le \frac{\pi}{2}$

3.1) $\cos(\alpha)$ = อยู่ Q_1

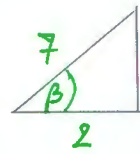


$\sqrt{7^2-5^2} = \sqrt{24} = 2\sqrt{6}$

$\cos(\alpha) = \frac{2\sqrt{6}}{7}$

3.2) $\sin(\beta)$ =

อยู่ Q_2



$\sqrt{7^2-2^2} = \sqrt{45} = 3\sqrt{5}$

$\sin(\beta) = \frac{3\sqrt{5}}{7}$

3.3) $\tan(\beta)$ =

$\frac{\pi}{2} \le \beta \le \pi$ อยู่ Q_2

$\tan(\beta) = \frac{-3\sqrt{5}}{2}$ อยู่ Q_2

3.4) $\sin(\alpha+\beta)$ =

$\sin(\alpha)\cos(\beta) + \cos(\alpha)\cdot\sin(\beta)$

$= \left(\frac{5}{7}\right)\left(-\frac{2}{7}\right) + \left(\frac{2\sqrt{6}}{7}\right)\left(\frac{3\sqrt{5}}{7}\right)$

$= \frac{-10+6\sqrt{30}}{49}$

3.5) $\cos(\beta-\alpha)$ =

$\cos(\beta-\alpha) = \cos(\beta)\cos(\alpha) + \sin(\beta)\sin(\alpha)$

$= \left(\frac{-2}{7}\right)\left(\frac{2\sqrt{6}}{7}\right) + \left(\frac{3\sqrt{5}}{7}\right)\cdot\left(\frac{5}{7}\right)$

$= \frac{-4\sqrt{6}+15\sqrt{5}}{49}$

3.6) $\tan(\alpha-\beta)$ =

$\tan(\alpha-\beta) = \frac{\tan(\alpha)-\tan(\beta)}{1+\tan(\alpha)\cdot\tan(\beta)}$

$= \frac{\frac{5}{2\sqrt{6}} - \left(-\frac{3\sqrt{5}}{2}\right)}{1+\left(\frac{5}{2\sqrt{6}}\right)\left(\frac{-3\sqrt{5}}{2}\right)} = \frac{-2\sqrt{5}}{7} - \frac{10\sqrt{6}}{21}$

3.7) $\cos(2\beta)$ =

$\cos(2\beta) = 2\cos^2(\beta) - 1$

$= 2\left(-\frac{2}{7}\right)^2 - 1$

$= \frac{-41}{49}$

3.8) $\tan(2\alpha)$ =

$\tan(2\alpha) = \frac{2\tan(\alpha)}{1-\tan^2(\alpha)}$

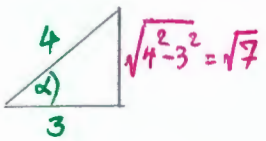
$= \frac{2\left(\frac{5}{2\sqrt{6}}\right)}{1-\left(\frac{5}{2\sqrt{6}}\right)^2} = -20\sqrt{6}$

4. กำหนด $A =$ $\frac{3\pi}{2}$, $B =$ 2π , $C =$ π , $D =$ $\frac{3\pi}{2}$ $\pi \le \beta \le \frac{3\pi}{2}$ อยู่ Q3

ถ้า $Con1 =$ $\cos(\alpha) = \frac{3}{4}$, $A \le \alpha \le B$ และ $Con2 =$ $\sin(\beta) = \frac{-3}{5}$, $C \le \beta \le D$ จงหา

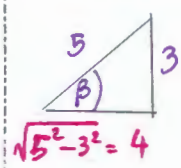
$\frac{3\pi}{2} \le \alpha \le 2\pi$ Q4

4.1) $\sin(\alpha)$ =



$\sin(\alpha) = \boxed{-\frac{\sqrt{7}}{4}}$ ใน Q4

4.2) $\cos(\beta)$ =



$\cos(\beta) = \boxed{-\frac{4}{5}}$ ใน Q3

4.3) $\tan(\alpha)$ =

$\tan(\alpha) = \boxed{-\frac{\sqrt{7}}{3}}$

4.4) $\sin(\alpha+\beta)$ =

$\sin(\alpha+\beta) = \sin(\alpha)\cos(\beta) + \cos(\alpha)\sin(\beta)$

$= \left(-\frac{\sqrt{7}}{4}\right)\left(-\frac{4}{5}\right) + \left(\frac{3}{4}\right)\left(-\frac{3}{5}\right)$

$= \boxed{\frac{\sqrt{7}}{5} - \frac{9}{20}}$

4.5) $\cos(\alpha-\beta)$ =

$\cos(\alpha-\beta) = \cos(\alpha)\cos(\beta) + \sin(\alpha)\sin(\beta)$

$= \left(\frac{3}{4}\right)\left(-\frac{4}{5}\right) + \left(-\frac{\sqrt{7}}{4}\right)\left(-\frac{3}{5}\right)$

$= \boxed{-\frac{3}{5} + \frac{3\sqrt{7}}{20}}$

4.6) $\tan(\beta-\alpha)$ =

$\tan(\beta-\alpha) = \frac{\tan(\beta) - \tan(\alpha)}{1 + \tan(\beta)\tan(\alpha)}$

$= \frac{\left(\frac{3}{4}\right) - \left(-\frac{\sqrt{7}}{3}\right)}{1 + \left(\frac{3}{4}\right)\left(-\frac{\sqrt{7}}{3}\right)} = \frac{9+4\sqrt{7}}{12-3\sqrt{7}} = \boxed{\frac{64}{27} + \frac{25\sqrt{7}}{27}}$

4.7) $\cos(2\beta)$ =

$\cos(2\beta) = 2\cos^2(\beta) - 1$

$= 2\left(-\frac{4}{5}\right)^2 - 1 = \boxed{\frac{7}{25}}$

4.8) $\tan(2\alpha)$ =

$\tan(2\alpha) = \frac{2\tan(\alpha)}{1-\tan^2(\alpha)} = \frac{2\left(-\frac{\sqrt{7}}{3}\right)}{1-\left(-\frac{\sqrt{7}}{3}\right)^2}$

$= \boxed{-3\sqrt{7}}$

5. ถ้า $Cond =$ $\cos(44^\circ) = 0.719$

จงหา $Question =$ $\cos(22^\circ)$

$\cos(22^\circ) = \cos\left(\frac{44^\circ}{2}\right) = \sqrt{\frac{1+\cos(44^\circ)}{2}}$

$= \sqrt{\frac{1+0.719}{2}} = \boxed{0.927}$

$= \boxed{\sqrt{0.8595}}$ หรือ

6. ถ้า $Cond =$ $\cos(18^\circ) = 0.951$

จงหา $Question =$ $\sin(9^\circ)$

$\sin(9^\circ) = \sin\left(\frac{18}{2}\right) = \sqrt{\frac{1-\cos(18^\circ)}{2}}$

$= \sqrt{\frac{1-0.951}{2}} = \boxed{\sqrt{0.0245}}$ หรือ

$= \boxed{0.156}$

TrigonometryExercise4 for No.1

$$No1 = \begin{bmatrix} .1 = \cos\left(\frac{\pi}{12}\right) & .2 = \sin(75^o) \\ .3 = \tan(105^o) & .4 = \sec\left(\frac{13\pi}{12}\right) \\ .5 = \cot((-285)^o) & .6 = \cos(345^o) \\ .7 = \csc\left(-\frac{5\pi}{12}\right) & .8 = \tan\left(\frac{17\pi}{12}\right) \end{bmatrix}, No2 = \begin{bmatrix} .1 = \dfrac{\tan\left(\frac{5\pi}{36}\right) + \tan\left(\frac{\pi}{36}\right)}{1 - \tan\left(\frac{5\pi}{36}\right)\tan\left(\frac{\pi}{36}\right)} & .2 = \cos(35^o)\cos(10^o) - \sin(35^o)\sin(10^o) \\ .3 = \dfrac{\tan(50^o) - \tan(20^o)}{1 + \tan(50^o)\tan(20^o)} & .4 = \sin(85^o)\cos(25^o) - \cos(85^o)\sin(25^o) \\ .5 = \cos\left(\frac{5\pi}{9}\right)\cos\left(\frac{\pi}{18}\right) + \sin\left(\frac{5\pi}{9}\right)\sin\left(\frac{\pi}{18}\right) & .6 = \dfrac{2\tan(15^o)}{1 - \tan(15^o)^2} \\ .7 = 2\cos\left(\frac{\pi}{8}\right)^2 - 1 & .8 = 1 - 2\sin(22.5^o)^2 \\ .9 = \cos(15^o)^2 - \sin(15^o)^2 & .10 = 2\sin\left(\frac{\pi}{12}\right)\cos\left(\frac{\pi}{12}\right) \end{bmatrix}, , \begin{bmatrix} \underline{:)} \\ :(\\ \left[\left[\begin{matrix} P \\ V \\ S \\ S \end{matrix}\right]\right] \\ \& \\ \left[\left[\begin{matrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{matrix}\right]\right] \\ \underline{:)} \\ :(\\ \underline{:)} \\ :(\end{bmatrix}$$

$$No3 = \begin{bmatrix} \left[A = 0, B = \frac{\pi}{2}, C = \frac{\pi}{2}, D = \pi\right] \\ \left[Cond1 = \left(\sin(\alpha) = \frac{5}{7}\right), Cond2 = \left(\cos(\beta) = \frac{-2}{7}\right)\right] \\ \left[\left[\begin{matrix} .1 = \cos(\alpha) & .2 = \sin(\beta) \\ .3 = \tan(\beta) & .4 = \sin(\alpha+\beta) \\ .5 = \cos(\beta-\alpha) & .6 = \tan(\alpha-\beta) \\ .7 = \cos(2\beta) & .8 = \tan(2\alpha) \end{matrix}\right]\right] \end{bmatrix}, , No4 = \begin{bmatrix} \left[A = \frac{3\pi}{2}, B = 2\pi, C = \pi, D = \frac{3\pi}{2}\right] \\ \left[Cond1 = \left(\cos(\alpha) = \frac{3}{4}\right), Cond2 = \left(\sin(\beta) = \frac{-3}{5}\right)\right] \\ \left[\left[\begin{matrix} .1 = \sin(\alpha) & .2 = \cos(\beta) \\ .3 = \tan(\alpha) & .4 = \sin(\alpha+\beta) \\ .5 = \cos(\alpha-\beta) & .6 = \tan(\beta-\alpha) \\ .7 = \cos(2\beta) & .8 = \tan(2\alpha) \end{matrix}\right]\right] \end{bmatrix}$$

$$No5 = [Cond = (\cos(44^o) = 0.719), Question = \cos(22^o)], \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$No6 = [Cond = (\cos(18^o) = 0.951), Question = \sin(9^o)], \quad , \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

TrigonometryExercise4 Answers for No.1

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

$$Ans2 = \begin{bmatrix} .1 = \left(\frac{\mathrm{Tan}\left(\frac{5\pi}{36}\right) + \mathrm{Tan}\left(\frac{\pi}{36}\right)}{1 - \mathrm{Tan}\left(\frac{5\pi}{36}\right)\mathrm{Tan}\left(\frac{\pi}{36}\right)} = \left(\mathrm{Tan}\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{3}\right)\right) & .2 = \left(\mathrm{Cos}(35^{o})\,\mathrm{Cos}(10^{o}) - \mathrm{Sin}(35^{o})\,\mathrm{Sin}(10^{o}) = \left(\mathrm{Cos}(45^{o}) = \frac{\sqrt{2}}{2}\right)\right) \\ .3 = \left(\frac{\mathrm{Tan}(50^{o}) - \mathrm{Tan}(20^{o})}{1 + \mathrm{Tan}(50^{o})\,\mathrm{Tan}(20^{o})} = \left(\mathrm{Tan}(30^{o}) = \frac{\sqrt{3}}{3}\right)\right) & .4 = \left(\mathrm{Sin}(85^{o})\,\mathrm{Cos}(25^{o}) - \mathrm{Cos}(85^{o})\,\mathrm{Sin}(25^{o}) = \left(\mathrm{Sin}(60^{o}) = \frac{\sqrt{3}}{2}\right)\right) \\ .5 = \left(\mathrm{Cos}\left(\frac{5\pi}{9}\right)\mathrm{Cos}\left(\frac{\pi}{18}\right) + \mathrm{Sin}\left(\frac{5\pi}{9}\right)\mathrm{Sin}\left(\frac{\pi}{18}\right) = \left(\mathrm{Cos}\left(\frac{\pi}{2}\right) = 0\right)\right) & .6 = \left(\frac{2\,\mathrm{Tan}(15^{o})}{1 - \mathrm{Tan}(15^{o})^{2}} = \left(\mathrm{Tan}(30^{o}) = \frac{\sqrt{3}}{3}\right)\right) \\ .7 = \left(2\,\mathrm{Cos}\left(\frac{\pi}{8}\right)^{2} - 1 = \left(\mathrm{Cos}\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\right)\right) & .8 = \left(1 - 2\,\mathrm{Sin}(22.5^{o})^{2} = \left(\mathrm{Cos}(45^{o}) = \frac{\sqrt{2}}{2}\right)\right) \\ .9 = \left(\mathrm{Cos}(15^{o})^{2} - \mathrm{Sin}(15^{o})^{2} = \left(\mathrm{Cos}(30^{o}) = \frac{\sqrt{3}}{2}\right)\right) & .10 = \left(2\,\mathrm{Sin}\left(\frac{\pi}{12}\right)\mathrm{Cos}\left(\frac{\pi}{12}\right) = \left(\mathrm{Sin}\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)\right) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ :) \\ :(\\ \begin{bmatrix}\begin{bmatrix} M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \end{bmatrix}\end{bmatrix} \\ :) \\ :(\\ :) \\ :(\\ :) \\ :(\end{bmatrix}$$

$$Ans3 = \begin{bmatrix} .1 = \left(\mathrm{Cos}(\alpha) = \frac{2\sqrt{6}}{7}\right) & .2 = \left(\mathrm{Sin}(\beta) = \frac{3\sqrt{5}}{7}\right) \\ .3 = \left(\mathrm{Tan}(\beta) = -\frac{3\sqrt{5}}{2}\right) & .4 = \left(\mathrm{Sin}(\alpha + \beta) = -\frac{10}{49} + \frac{6\sqrt{6}\sqrt{5}}{49}\right) \\ .5 = \left(\mathrm{Cos}(\beta - \alpha) = -\frac{4\sqrt{6}}{49} + \frac{15\sqrt{5}}{49}\right) & .6 = \left(\mathrm{Tan}(\alpha - \beta) = -\frac{10\sqrt{6}}{21} - \frac{2\sqrt{5}}{7}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{-41}{49}\right) & .8 = (\mathrm{Tan}(2\alpha) = -20\sqrt{6}) \end{bmatrix}, \; Ans4 = \begin{bmatrix} .1 = \left(\mathrm{Sin}(\alpha) = -\frac{\sqrt{7}}{4}\right) & .2 = \left(\mathrm{Cos}(\beta) = \frac{-4}{5}\right) \\ .3 = \left(\mathrm{Tan}(\alpha) = -\frac{\sqrt{7}}{3}\right) & .4 = \left(\mathrm{Sin}(\alpha + \beta) = \frac{\sqrt{7}}{5} - \frac{9}{20}\right) \\ .5 = \left(\mathrm{Cos}(\alpha - \beta) = -\frac{3}{5} + \frac{3\sqrt{7}}{20}\right) & .6 = \left(\mathrm{Tan}(\beta - \alpha) = \frac{64}{27} + \frac{25\sqrt{7}}{27}\right) \\ .7 = \left(\mathrm{Cos}(2\beta) = \frac{7}{25}\right) & .8 = (\mathrm{Tan}(2\alpha) = -3\sqrt{7}) \end{bmatrix}, \begin{bmatrix} :) \\ :(\\ M \\ a \\ t \\ h \\ @ \\ M \\ U \\ T \\ :) \\ :(\end{bmatrix}$$

$$Ans5 = (\mathrm{Cos}(22^{o}) = (\mathrm{Sqrt}(0.8595) = 0.927)), \; \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

$$Ans6 = (\mathrm{Sin}(9^{o}) = (\mathrm{Sqrt}(0.0245) = 0.156)), \; \begin{bmatrix} M \\ U \\ T \end{bmatrix}$$

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