

5-7-18 1st Try

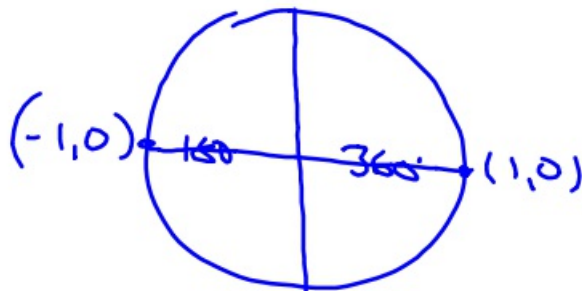
Test tomorrow

Domain is $(0, 360]$

$$\textcircled{1} (\cos x + 1)(\cos x - 1) = 0$$

$$\begin{array}{r} \cos x + 1 = 0 \\ -1 - 1 \\ \hline \cos x = -1 \\ x = 180^\circ \end{array}$$

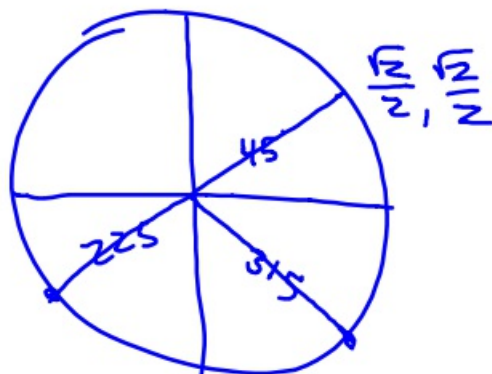
$$\begin{array}{r} \cos x - 1 = 0 \\ +1 + 1 \\ \hline \cos x = 1 \\ x = 360^\circ \end{array}$$



$$\textcircled{2} \frac{2 \sin x}{2} = -\frac{\sqrt{2}}{2}$$

$$\sin x = -\frac{\sqrt{2}}{2}$$

$$x = 225^\circ, 315^\circ$$



$$\textcircled{3} \tan^2 x - 1 = 0$$

$$\textcircled{1} \tan^2 x - 1 = 0$$

$$\frac{+1 + 1}{\tan^2 x = 1}$$

$$\tan x = \pm 1$$

$$\frac{\sin x}{\cos x} = \pm 1$$

$$\frac{\sin x}{\cos x} = 1 \quad \frac{\sin x}{\cos x} = -1$$

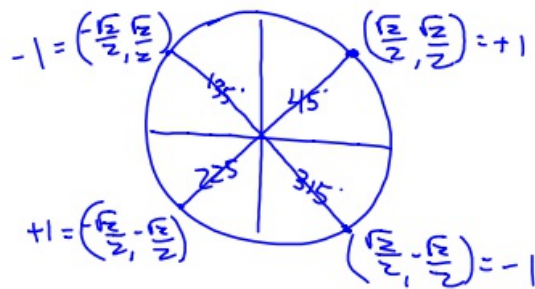
$$\textcircled{2} \tan^2 x - 1 = 0$$

$$(\tan x - 1)(\tan x + 1) = 0$$

$$\tan x - 1 = 0 \text{ OR } \tan x + 1 = 0$$

$$\tan x = 1 \quad \tan x = -1$$

$$\frac{\sin x}{\cos x} = 1 \quad \frac{\sin x}{\cos x} = -1$$



$$\textcircled{4} \log_2 8 = 3 \quad 2^{\square} = 8$$

$$\textcircled{5} \log 100 = 2$$

$$\textcircled{6} \log_1 3 = \text{No solution} \quad \square = 3$$

Find x

$$\textcircled{7} \log_4 x = 3$$

$$4^3 = x$$

$$64 = x$$

$$\textcircled{8} \log_2 \frac{x-1}{3} = 3$$

$$2^3 = \frac{x-1}{3}$$

$$3 \cdot 8 = \frac{x-1}{3} \cdot 3$$

$$\begin{array}{r} 24 = x-1 \\ +1 \quad +1 \\ \hline 25 = x \end{array}$$

$$\textcircled{9} 2^x = 15$$

$$\log 2^x = \log 15$$

$$\frac{x \cdot \log 2}{\log 2} = \frac{\log 15}{\log 2}$$

$$x \approx 3.91$$

$$\textcircled{10} \text{ If } \sin \theta = \frac{1}{5}, \text{ find } \cos 2\theta.$$

$$\cos 2\theta = \begin{cases} \cos^2 \theta - \sin^2 \theta \\ 2\cos^2 \theta - 1 \\ 1 - 2\sin^2 \theta \end{cases}$$

$$\cos 2\theta = 1 - 2\sin^2 \theta$$

$$= 1 - \frac{2}{1} \cdot \frac{1}{5} \cdot \frac{1}{5}$$

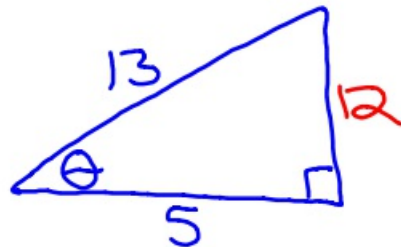
$$= 1 - \frac{2}{25}$$

$$= \frac{25}{25} - \frac{2}{25}$$

$$= \frac{23}{25}$$

⑪ If $\cos \theta = \frac{5}{13}$, find $\sin 2\theta$.

$$\sin 2\theta = 2 \cdot \sin \theta \cdot \cos \theta$$



$$5^2 + b^2 = 13^2$$

$$b = 12$$

$$\begin{aligned} \sin 2\theta &= \frac{2}{1} \cdot \frac{12}{13} \cdot \frac{5}{13} \\ &= \frac{120}{169} \end{aligned}$$

⑫ $5^{x+3} = 10,000$

$$\log 5^{x+3} = \log 10,000$$

$$\frac{(x+3) \cdot \log 5}{\log 5} = \frac{\log 10,000}{\log 5}$$

$$x+3 \approx 5.72$$

$$\begin{array}{r} x+3 \approx 5.72 \\ -3 \quad -3 \\ \hline \end{array}$$

$$x \approx 2.72$$

5-7-18 3rd Trig

Domain: $(0, 360]$

$$\textcircled{1} (\cos x - 1)(\cos x + 1) = 0$$

$$\frac{\cos x - 1}{+1 + 1} = 0$$

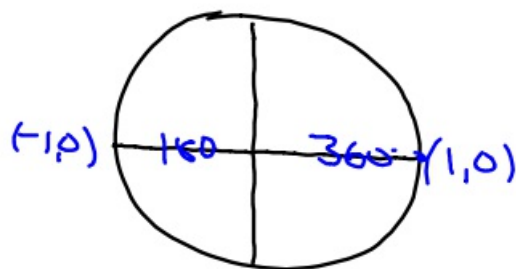
$$\cos x = 1$$

360°

$$\frac{\cos x + 1}{-1 - 1} = 0$$

$$\cos x = -1$$

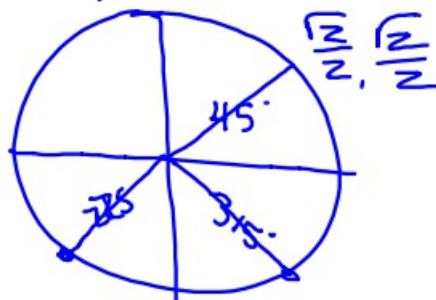
180°



$$\textcircled{2} \frac{2 \sin x}{2} = -\frac{\sqrt{2}}{2}$$

$$\sin x = -\frac{\sqrt{2}}{2}$$

$225^\circ, 315^\circ$



$$\textcircled{3} \tan^2 x - 1 = 0$$

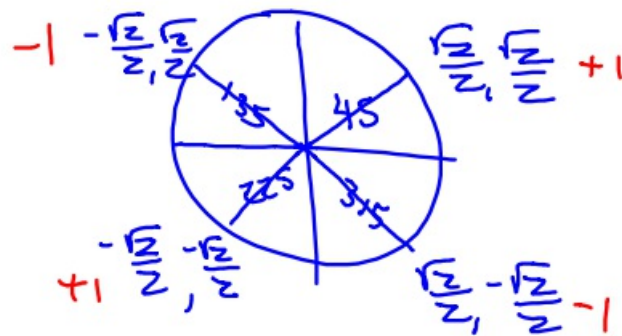
$$\frac{\quad}{+1 + 1}$$

$$\sqrt{\tan^2 x} = \sqrt{1}$$

$$\tan x = \pm 1$$

$$\frac{\sin x}{\cos x} = \pm 1$$

$$45^\circ, 135^\circ, 225^\circ, 315^\circ$$



$$\textcircled{4} \log_4 16 = 2 \quad 4^x = 16$$

$$\textcircled{5} \log_2 8 = 3 \quad 2^{\square} = 8$$

$$\textcircled{6} \log 10,000 = 4$$

$$\textcircled{7} \log_2 \frac{x-2}{4} = 3$$

$$2^3 = \frac{x-2}{4}$$

$$4 \cdot 8 = \frac{x-2}{4} \cdot 4$$

$$32 = x - 2$$

$$\frac{\quad}{+2 \quad +2}$$

$$\underline{\quad \quad \quad}$$

$$34 = x$$

$$\textcircled{8} \log_1 4 = \text{no solution}$$

$$1^0 = 4$$

Solve for x .

$$\textcircled{9} \log_4 x = 3$$

$$4^3 = x$$

$$64 = x$$

$$\textcircled{10} \log_2 \frac{x-3}{5} = 3$$

$$2^3 = \frac{x-3}{5}$$

$$5 \cdot 8 = \frac{x-3}{5} \cdot 5$$

$$40 = x - 3$$

$$\begin{array}{r} 40 = x - 3 \\ +3 \quad +3 \\ \hline \end{array}$$

$$43 = x$$

⑪ If $\sin \theta = \frac{1}{6}$, find $\cos 2\theta$.

$$\cos 2\theta = \begin{cases} \cos^2 \theta - \sin^2 \theta \\ 2\cos^2 \theta - 1 \\ 1 - 2\sin^2 \theta \checkmark \end{cases}$$

$$\cos 2\theta = 1 - 2\sin^2 \theta$$

$$1 - 2 \cdot \frac{1}{6} \cdot \frac{1}{6}$$

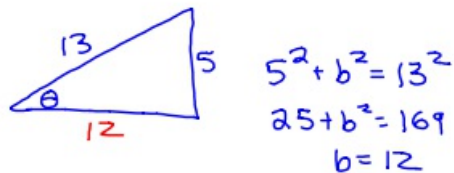
$$1 - \frac{2}{36}$$

$$\frac{36 - 2}{36 - 36}$$

$$\frac{34}{36} = \frac{17}{18}$$

⑫ If $\sin \theta = \frac{5}{13}$, find $\sin 2\theta$.

$$\sin 2\theta = 2 \cdot \sin \theta \cdot \cos \theta$$



$$\sin 2\theta = 2 \cdot \sin \theta \cdot \cos \theta$$

$$2 \cdot \frac{5}{13} \cdot \frac{12}{13}$$

$$= \frac{120}{169}$$

⑬ $2 \cos^2 x - \cos x - 1 = 0$

$$n = \cos x \quad 2n^2 - n - 1 = 0$$

$$(2n + 1)(n - 1) = 0$$

$$(2 \cos x + 1)(\cos x - 1) = 0$$

$$2 \cos x + 1 = 0$$

$$-1 - 1$$

$$\frac{2 \cos x = -1}{2}$$

$$\cos x = -\frac{1}{2}$$

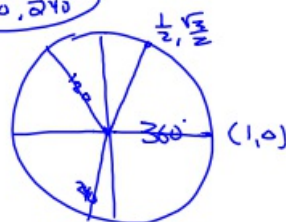
$$120^\circ, 240^\circ$$

$$\cos x - 1 = 0$$

$$+1 + 1$$

$$\cos x = 1$$

$$360^\circ$$



5-7-18 4th Trig

$$\textcircled{1} (\cos x - 1)(\cos x + 1) = 0$$

$$\begin{array}{r} \cos x - 1 = 0 \quad \text{OR} \\ +1 \quad +1 \\ \hline \end{array}$$

$$\cos x = 1$$

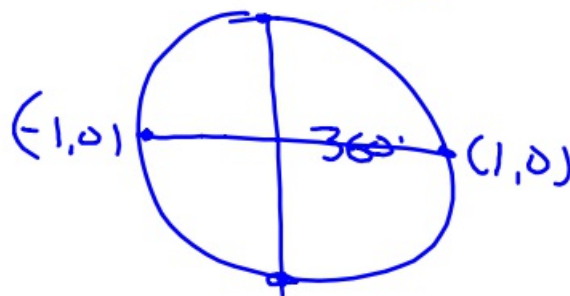
$$x = 360^\circ$$

$$\begin{array}{r} \cos x + 1 = 0 \\ -1 \quad -1 \\ \hline \end{array}$$

$$\cos x = -1$$

$$x = 180^\circ$$

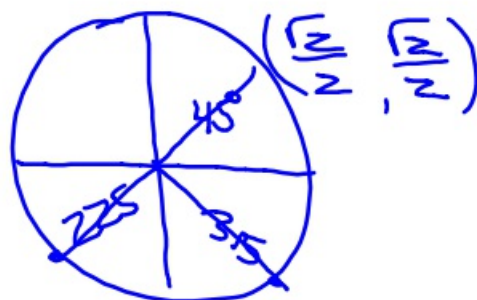
$(0, 360]$



$$\textcircled{2} \frac{2 \sin x}{2} = -\frac{\sqrt{2}}{2}$$

$$\sin x = -\frac{\sqrt{2}}{2}$$

$$225^\circ, 315^\circ$$



$$\textcircled{3} \tan^2 x - 1 = 0$$

$$(\tan x - 1)(\tan x + 1) = 0$$

$$\frac{\tan x - 1}{+1 + 1} \quad \text{OR} \quad \frac{\tan x + 1}{-1 - 1}$$

$$\tan x = 1$$

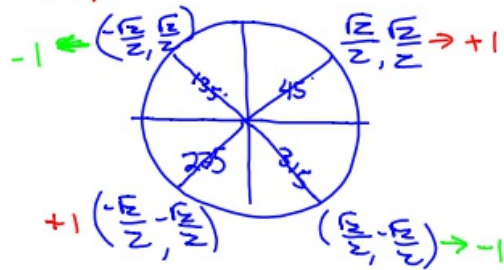
$$\tan x = -1$$

$$\frac{\sin x}{\cos x} = 1$$

$$\frac{\sin x}{\cos x} = -1$$

$$45^\circ, 225^\circ$$

$$135^\circ, 315^\circ$$



$$\textcircled{4} \log_4 16 = 2$$

$$4^2 = 16$$

$$\textcircled{5} \log_{10} 10,000 = 4$$

$$10^4 = 10,000$$

$$\textcircled{6} \log_1 3 = \text{No solution}$$

$$1^3 = 3$$

$$\textcircled{7} 4^x = 10$$

$$\log 4^x = \log 10$$

$$x \cdot \frac{\log 4}{\log 4} = \frac{\log 10}{\log 4}$$

$$x \approx 1.66$$

$$\textcircled{8} \log_5 \frac{x-3}{4} = 2$$

$$5^2 = \frac{x-3}{4}$$

$$4 \cdot 25 = \frac{x-3}{4} \cdot 4$$

$$100 = x - 3$$

$$\begin{array}{r} +3 \\ 100 = x - 3 \\ \hline 103 = x \end{array}$$

$$103 = x$$

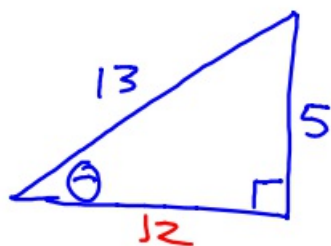
$$\cos 2\theta = \begin{cases} \cos^2 \theta - \sin^2 \theta \\ 2\cos^2 \theta - 1 \\ 1 - 2\sin^2 \theta \end{cases}$$

$$\sin 2\theta = 2 \cdot \sin \theta \cdot \cos \theta$$

⑨ If $\sin \theta = \frac{1}{7}$, find $\cos 2\theta$.

$$\begin{aligned} \cos 2\theta &= 1 - 2 \cdot \sin^2 \theta \\ &= 1 - \frac{2}{1} \cdot \frac{1}{7} \cdot \frac{1}{7} \\ &= 1 - \frac{2}{49} \\ &= \frac{49}{49} - \frac{2}{49} \\ &= \frac{47}{49} \end{aligned}$$

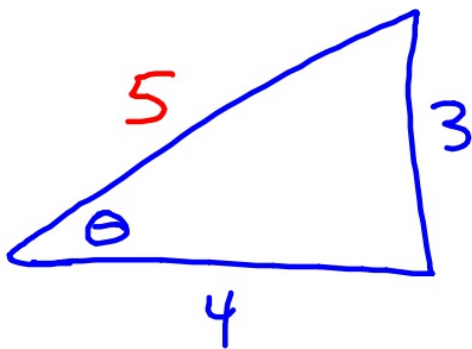
⑩ If $\sin \theta = \frac{5}{13}$, find $\sin 2\theta$.



$$\begin{aligned} 5^2 + b^2 &= 13^2 \\ b &= 12 \end{aligned}$$

$$\begin{aligned} \sin 2\theta &= 2 \cdot \sin \theta \cdot \cos \theta \\ &= \frac{2}{1} \cdot \frac{5}{13} \cdot \frac{12}{13} \\ &= \frac{120}{169} \end{aligned}$$

⑩ If $\tan \theta = \frac{3}{4}$, find $\cos 2\theta$.



Any of $\cos 2\theta$ formulas work

$$\cos^2 \theta - \sin^2 \theta$$

$$\frac{4}{5} \cdot \frac{4}{5} - \frac{3}{5} \cdot \frac{3}{5}$$

$$\frac{16}{25} - \frac{9}{25}$$

$$\frac{7}{25}$$