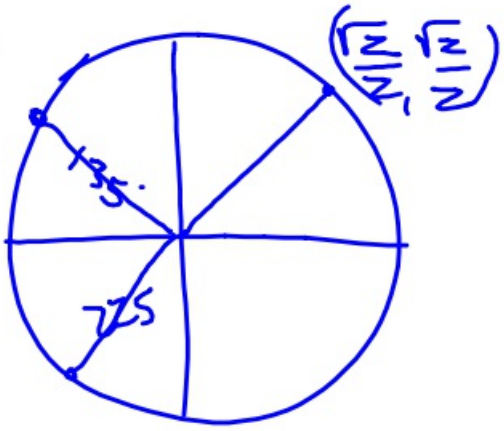
5-4-18 1st Trig

Test Tuesday

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

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

$x = 135^\circ, 225^\circ$



② $(\cos x - 1)(\sin x + 1) = 0$

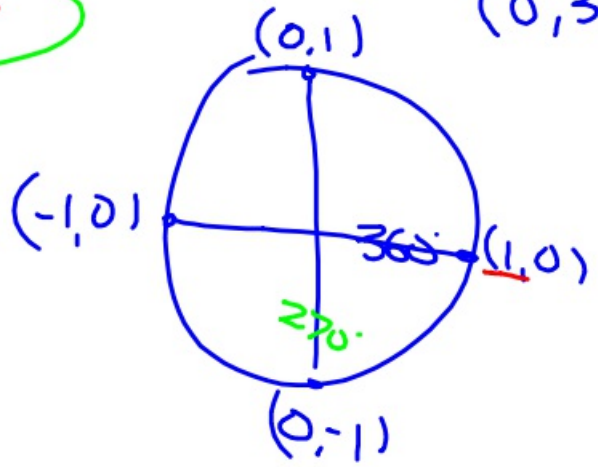
$\cos x - 1 = 0$ OR $\sin x + 1 = 0$

$+1 \quad +1$ $\quad -1 \quad -1$

$\cos x = 1$ $\quad \sin x = -1$

$x = 360^\circ$ $\quad x = 270^\circ$

$(0, 360]$



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

$2\cos^2\theta - 1$

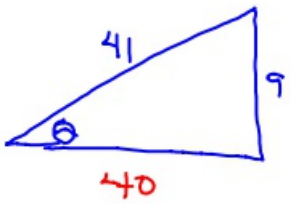
$1 - 2\sin^2\theta$

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

③ If $\cos\theta = \frac{1}{3}$, find $\cos 2\theta$.

$$\cos 2\theta = 2 \cdot \cos^2\theta - 1$$
$$= \frac{2}{1} \cdot \frac{1}{3} \cdot \frac{1}{3} - 1$$
$$= \frac{2}{9} - 1$$
$$= \frac{2}{9} - \frac{9}{9}$$
$$= -\frac{7}{9}$$

④ If $\sin\theta = \frac{9}{41}$ find $\sin 2\theta$.



$a^2 + b^2 = 41^2$

$81 + b^2 = 1681$

$b^2 = 1600$

$b = 40$

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

$$= \frac{2}{1} \cdot \frac{40}{41} \cdot \frac{9}{41}$$
$$= \frac{720}{1681}$$

⑤ $\log_3 9 = 2$ $\quad 3^{\square} = 9$

⑥ $\log 1000 = 3$

Solve for x.

⑦ $\log_4 x = 2$ $\quad 4^2 = x$

$x = 16$

⑧ $\log_5 \frac{x}{2} = 2$

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

$2 \cdot 25 = \frac{x}{2} \cdot 2$

$50 = x$

⑨ $\log 6^x = \log 200$

$\frac{x \cdot \log 6}{\log 6} = \frac{\log 200}{\log 6}$

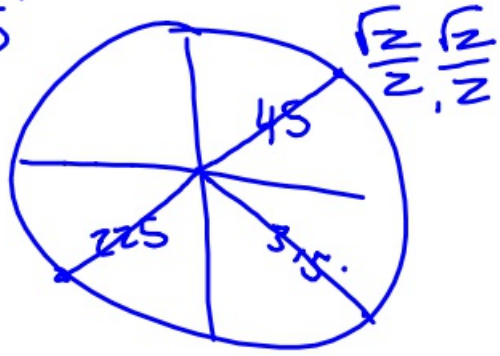
$x \approx 2.96$

5-4-18

① $\frac{2 \cdot \sin\theta}{2} = \frac{-\sqrt{2}}{2}$

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

$\theta = 225°, 315°$



② $(\cos\theta - 1)(\sin\theta + 1) = 0$

$\cos\theta - 1 = 0$

$+1 \quad +1$

$\cos\theta = 1$

$\theta = 360°$

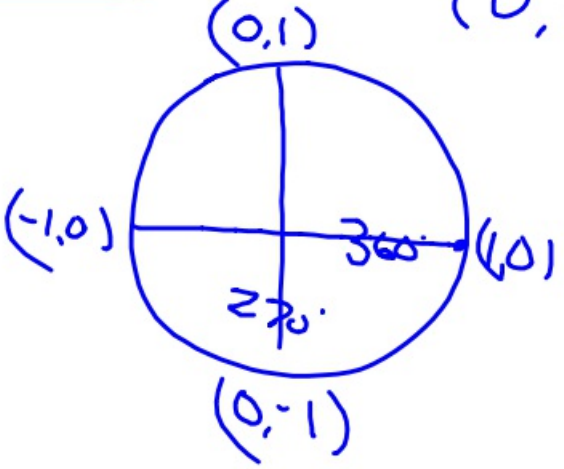
$\sin\theta + 1 = 0$

$-1 \quad -1$

$\sin\theta = -1$

$\theta = 270°$

$(0, 360]$



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

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

(3) If $\cos\theta = \frac{1}{5}$, find $\cos 2\theta$.

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

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

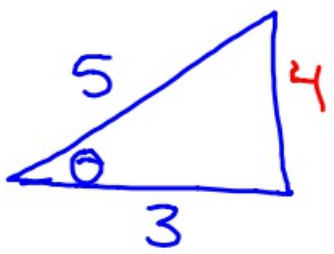
$$= \frac{2}{25} - 1$$

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

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

(4) If $\cos\theta = \frac{3}{5}$, find $\sin 2\theta$.

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



$$\sin 2\theta = \frac{2}{1} \cdot \frac{4}{5} \cdot \frac{3}{5} = \frac{24}{25}$$

⑤ $\log 1000 = 3$

⑥ $\log_2 8 = 3$ $\quad 2^{\square} = 8$

⑦ $\log_3 81 = 4$ $\quad 3^{\square} = 81$

Solve for x.

⑧ $\log_4 x = 3$ $\quad 4^3 = x$

$x = 64$

⑨ $\log_5 \frac{x}{2} = 2$

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

$2 \cdot 25 = \frac{x}{2} \cdot 2$

$50 = x$

(10) $\log 3^x = \log 20$

$$x \cdot \frac{\log 3}{\log 3} = \frac{\log 20}{\log 3}$$

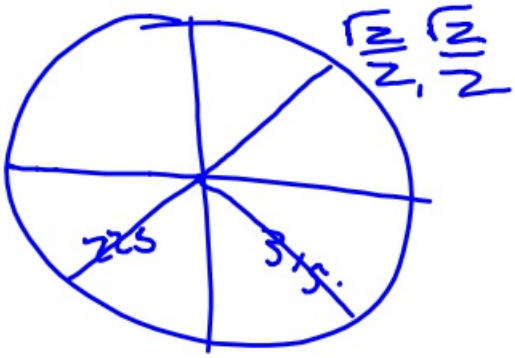
$$x \approx 2.73$$

5-4-18 4th Trig

① $\frac{2}{2}\cdot \sin\theta = -\frac{\sqrt{2}}{2}$

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

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



② $(\cos\theta - 1)(\sin\theta + 1) = 0$

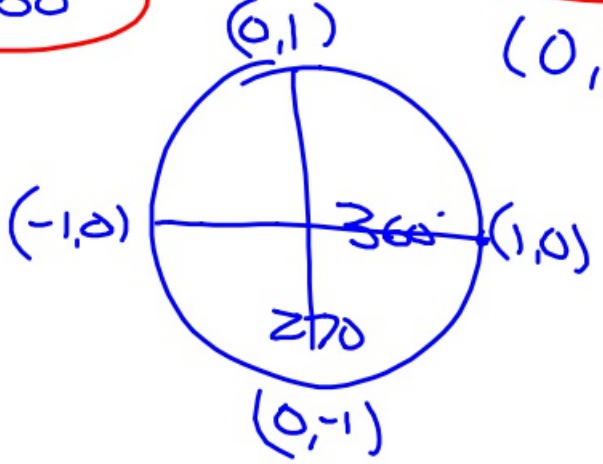
$\cos\theta - 1 = 0$ OR $\sin\theta + 1 = 0$

$+1 \quad +1$ $\quad -1 \quad -1$

$\cos\theta = 1$ $\quad \sin\theta = -1$

360° $\quad 270^\circ$

$(0, 360]$



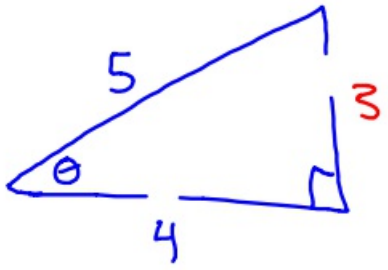
$$\cos 2\theta = \begin{cases} \cos^2\theta - \sin^2\theta \\ 2\cos^2\theta - 1 \\ 1 - 2\sin^2\theta \end{cases}$$

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

(3) If $\cos\theta = \frac{2}{3}$, what is $\cos 2\theta$.

$$\cos 2\theta = 2 \cdot \cos^2\theta - 1$$
$$= \frac{2}{1} \cdot \frac{2}{3} \cdot \frac{2}{3} - 1$$
$$= \frac{8}{9} - 1$$
$$= \frac{8}{9} - \frac{9}{9}$$
$$= \frac{-1}{9}$$

(4) If $\cos\theta = \frac{4}{5}$, find $\sin 2\theta$.



$$\sin 2\theta = 2 \cdot \sin\theta \cdot \cos\theta$$
$$= \frac{2}{1} \cdot \frac{3}{5} \cdot \frac{4}{5}$$
$$= \frac{24}{25}$$

(5) $\log 100 = 2$

(6) $\log_2 8 = 3$ $\quad 2^{\square} = 8$

(7) $\log_5 \frac{1}{25} = -2$ $\quad 5^{\square} = \frac{1}{25}$

Solve for x.

(8) $\log_x 64 = 2$ $\quad x^2 = 64$

$x = 8$

(9) $\log_5 \frac{x}{3} = 2$

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

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

$75 = x$

(10) $\log 3^x = \log 18$

$x \cdot \frac{\log 3}{\log 3} = \frac{\log 18}{\log 3}$

$x \approx 2.63$