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40/ $8\cos\theta = \cot\theta$

$\sin\theta\left[8\cos\theta = \dfrac{\cos\theta}{\sin\theta}\right]$

$8\sin\theta\cos\theta = \cos\theta$

$[0°, 360°]$

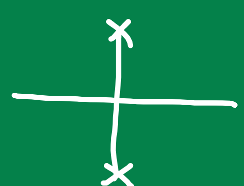
$8\sin\theta\cos\theta - \cos\theta = 0$

$\cos\theta(8\sin\theta - 1) = 0$

$\cos\theta = 0$ $\quad$ $8\sin\theta - 1 = 0$

$\sin\theta = \frac{1}{8}$

$\sin^{-1}(1/8) = 7.2°$



$90°, 270°, 7.2°, 172.8°$

26/ $\cos^2\theta = \sin^2\theta + 1$

$\cancel{1} - \sin^2\theta = \sin^2\theta + \cancel{1}$ $\qquad [0°, 360°)$

$0 = 2\sin^2\theta$

$\sqrt{0} = \sqrt{\sin^2\theta}$

$0 = \sin\theta$

$0°, 180°$

16/ $2\cos^2 x - \sqrt{3}\cos x = 0$

$\cos x(2\cos x - \sqrt{3}) = 0$

$\cos x = 0 \quad \cos x = \frac{\sqrt{3}}{2}$

TRIG EQUATIONS PART 2

Use identities
1) When there are different trig functions.
2) When there are different angles.

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$[2\sin x]^2 = [1-2\cos x]^2$ $\quad [0°, 360°)$

#6: $\sin^2 x + \cos^2 x = 1$

must check answers.

$4\sin^2 x = (1-2\cos x)(1-2\cos x)$

$4\sin^2 x = 1 - 4\cos x + 4\cos^2 x$

$4(1-\cos^2 x) = 1 - 4\cos x + 4\cos^2 x$

$4 - 4\cos^2 x = \underset{-4}{1} - 4\cos x + 4\cos^2 x$

$0 = 8\cos^2 x - 4\cos x - 3$

$\cancel{0 = (8\cos x - 3)(\cos x + 1)}$

$$\cos x = \frac{4 \pm \sqrt{16 - 4(8)(-3)}}{2(8)} = \frac{4 \pm \sqrt{112}}{16}$$

$\cos x = 0.911$ $\qquad \cos x = -0.411$

$\cos^{-1}(0.911) = 24.3°$

$\cos^{-1}(0.911) = 65.7°$

$x = \cancel{24.3°}, 335.7°, 114.3°, \cancel{245.7°}$

$$\sin x = \cos\left(\frac{x}{2}\right)$$

$$(\sin x)^2 = \left(\pm\sqrt{\frac{1+\cos x}{2}}\right)^2$$

$$\sin^2 x = \frac{1+\cos x}{2}$$

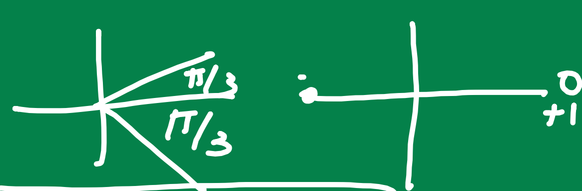
$$2\left(1-\cos^2 x\right) = \frac{1+\cos x}{\cancel{2}}\,\cancel{2}$$

$$2 - 2\cos^2 x = 1 + \cos x$$

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

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

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



$$\boxed{x = \frac{\pi}{3},\ \frac{5\pi}{3},\ \pi}$$

$$\sin \underline{x} - \sin \underline{2x} = 0$$

$$\sin x - 2\sin x \cos x = 0$$

$$\sin x\,(1 - 2\cos x) = 0$$

$$\sin x = 0 \qquad 1 - 2\cos x = 0$$

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

INVERSE TRIG EQUATIONS

Know 8 fund. identities

Know inv. trig func quadrants (for pts.)

$\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)$

solution: angle in radians

$\boxed{-\frac{\pi}{4}}$

$\tan\left(\sin^{-1} -\frac{\sqrt{2}}{2}\right)$

numerical value

$\tan\left(-\frac{\pi}{4}\right)$

-1

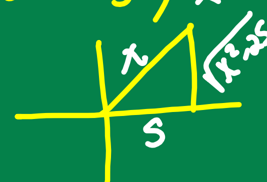
$\sec\left(\overset{\theta}{\text{Arccot}}\ -\frac{3}{7}\right)\ \frac{x}{y}$

$9 + 49 = r^2$

$\sqrt{58} = \sqrt{r^2}$

$\sec\theta = \frac{r}{x} = \frac{\sqrt{58}}{-3}$

$\csc\left(\sec^{-1} \frac{x}{5}\right)\ \frac{r}{x}$



$y^2 + 25 = x^2$

$\sqrt{y^2} = \sqrt{x^2 - 25}$

$\csc\theta = \frac{r}{y} = \boxed{\frac{x}{\sqrt{x^2-25}}}$

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7) Double Angle

$\cos(2\theta)$

$\cos\left(2\,\underbrace{\text{Arcsin}\,-\tfrac{3}{4}}\right)$

$\cos(2\theta)$

$x^2+9=16$

$\sqrt{x^2}=\sqrt{7}$

$x=\pm\sqrt{7}$

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

Can use any of the three cos 2A identities.

$= 1-2\left(\frac{-3}{4}\right)^2$

$1-2\cdot\frac{9}{16}=1-\frac{18}{16}=\frac{-2}{16}=-\frac{1}{8}$

8) Sum + Diff

$\sin[A-B]$

2 pictures!