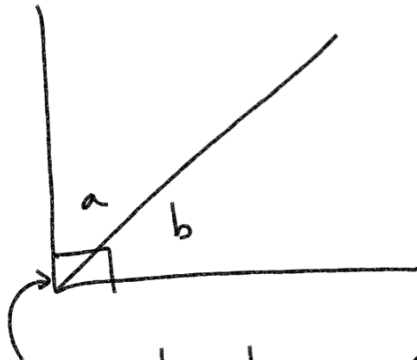


# MTH-PT Trigonometry

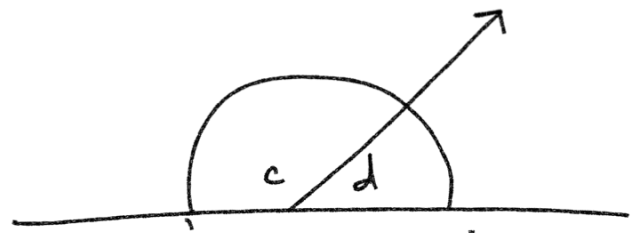
Session 8 2/19



perpendicular  $\rightarrow$   $90^\circ$

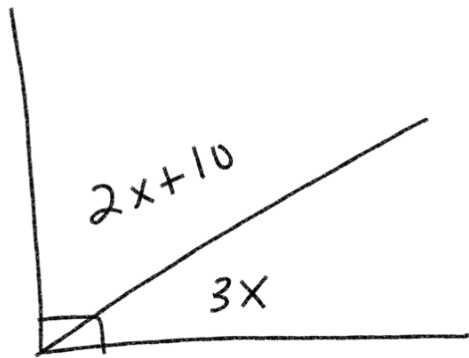
$$a + b = 90^\circ$$

Complementary



$$c + d = \underline{\underline{180^\circ}}$$

Supplementary

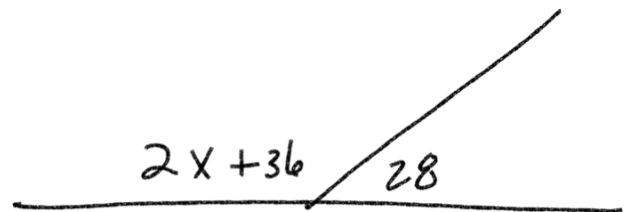


$$2x + 10 + 3x = 90$$

$$\begin{array}{r} 5x + 10 = 90 \\ -10 \quad -10 \end{array}$$

$$\frac{5x}{5} = \frac{80}{5}$$

$$\boxed{x = 16}$$

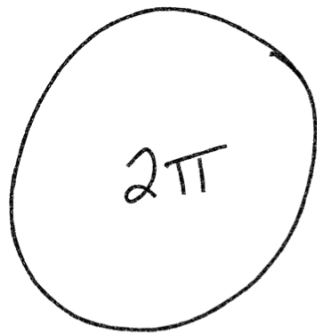
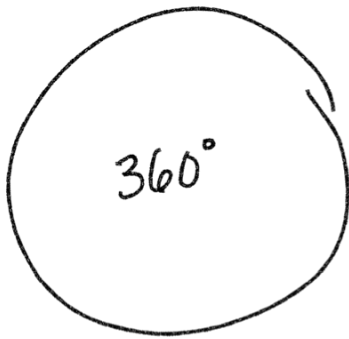


$$2x + 36 + 28 = 180$$

$$\begin{array}{r} 2x + 64 = 180 \\ -64 \quad -64 \end{array}$$

$$\frac{2x}{2} = \frac{116}{2}$$

$$\boxed{x = 58}$$



$$\frac{360^\circ}{2} = \frac{2\pi}{2}$$

$$180^\circ = \pi$$

Degrees  $\rightarrow$  Radians

$$\frac{45^\circ}{1} * \left( \frac{\pi}{180^\circ} \right) = \frac{45\pi}{180} \div 45 = \boxed{\frac{\pi}{4}}$$

Reduce

$$\frac{12 \text{ donuts}}{1 \text{ dozen}} = 1$$

$$\left[ \frac{\pi}{180^\circ} \right] \text{ or } \left[ \frac{180^\circ}{\pi} \right] \text{ or } 1$$

Radians  $\rightarrow$  Degrees

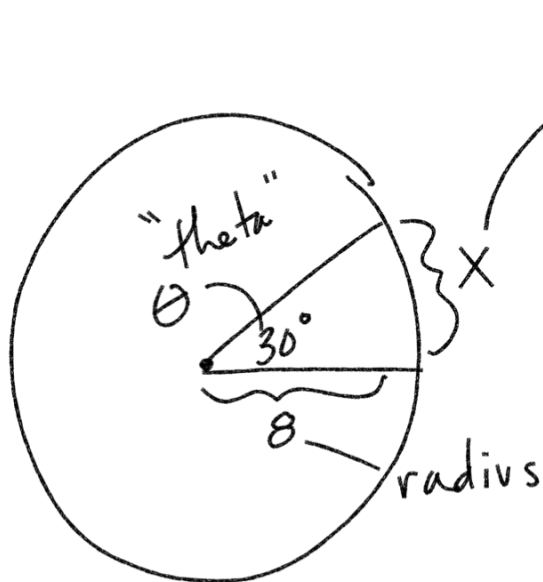
$$\frac{3\pi}{4} * \frac{180^\circ}{\pi} = \frac{540^\circ}{4} = \boxed{135^\circ}$$

$300^\circ \rightarrow$  \_\_\_\_\_ radians

$\frac{7\pi}{6} \rightarrow$  \_\_\_\_\_ degrees

$$300^\circ * \frac{\pi}{180^\circ} = \frac{300\pi}{180} \div 60 = \frac{5\pi}{3}$$

$$\frac{7\pi}{6} * \frac{180^\circ}{\pi} = \boxed{210^\circ}$$



Arc length

Proportion

$$\frac{\text{Interior Angle}}{\text{Total Angle}} = \frac{30^\circ \div 30}{360^\circ \div 30} = \frac{1}{12}$$

Arc Length

$$\frac{1}{12} \neq \frac{x}{2\pi r}$$

$$2\pi r = 12x$$

$$2\pi(8) = 12x$$

$$\text{Circumference} = 2\pi r$$

$$\frac{16\pi}{12} = \frac{12x}{12}$$

$$x = \frac{16\pi}{12} = \boxed{\frac{4\pi}{3}}$$

$$30^\circ = \text{--- radians}$$

$$30^\circ * \frac{\pi}{180^\circ} = \frac{30\pi}{180} =$$

$$\left(\frac{\pi}{6}\right)$$

$$\frac{\theta}{360} = \frac{x}{2\pi r}$$

$$\frac{360x}{360} = \frac{2\pi r \theta}{360}$$

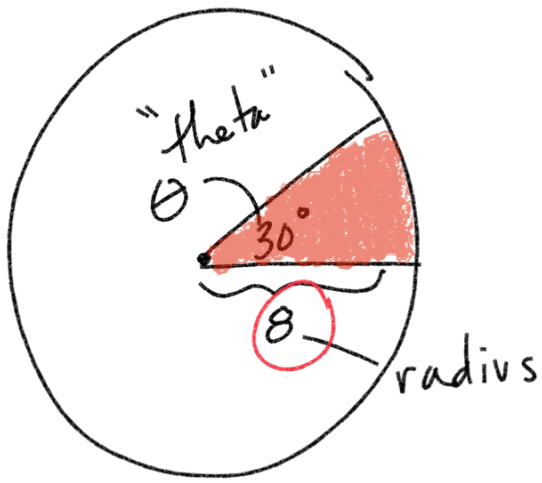
$$\theta \rightarrow \text{degrees} \quad \left. \begin{array}{l} X = \left\{ \frac{\pi r \theta}{180} \right\} \\ \theta \rightarrow \text{radians} \end{array} \right\}$$

$$x = r \theta$$

$$(8)\left(\frac{\pi}{6}\right) = \frac{8\pi}{6} = \boxed{\frac{4\pi}{3}}$$

$$\boxed{x = r \theta}$$

$$\frac{\pi(8)(30)}{180} = \frac{240\pi}{180} = \boxed{\frac{4\pi}{3}}$$



Find Area of shaded region.

$$\frac{30^\circ}{360^\circ} = \frac{1}{12}$$

$$\frac{1}{12} = \frac{\text{shaded area}}{\text{total area}}$$

Area of Circle :  $A = \pi r^2$

~~$$\frac{1}{12} = \frac{X}{\pi r^2}$$~~

$$X = \frac{\pi r^2}{12}$$

$$\frac{\pi r^2}{12} = \frac{12X}{12}$$

$$X = \frac{\pi(8)^2}{12} = \frac{64\pi}{12}$$

$$\boxed{\frac{16\pi}{3}}$$

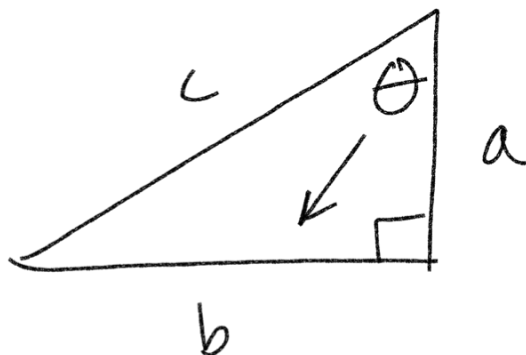
~~$$\frac{\theta}{360} = \frac{X}{\pi r^2}$$~~

$$\frac{360X}{360} = \frac{\theta \pi r^2}{360}$$

$$X = \frac{\theta \pi r^2}{360} \quad (\text{degrees})$$

$$\sin \theta = \frac{\text{opp}}{\text{hyp}} = \frac{b}{c} \quad \boxed{\text{SOH CAH TOA}} \quad \text{Right Triangle}$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}} = \frac{a}{c}$$



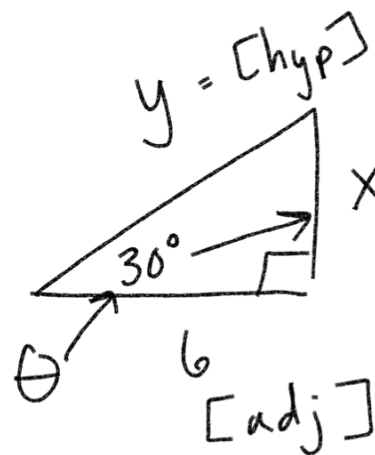
$$\tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{b}{a}$$

$$\tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{\frac{\text{opp}}{\text{hyp}}}{\frac{\text{adj}}{\text{hyp}}} = \frac{\text{opp}}{\text{adj}}$$

$$\text{cosecant} \\ \text{csc } \theta = \frac{1}{\sin \theta} = \frac{\text{hyp}}{\text{opp}} = \frac{c}{b}$$

$$\sec \theta = \frac{1}{\cos \theta} = \frac{\text{hyp}}{\text{adj}} = \frac{c}{a}$$

$$\cot \theta = \frac{1}{\tan \theta} = \frac{\text{adj}}{\text{opp}} = \frac{a}{b}$$



$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

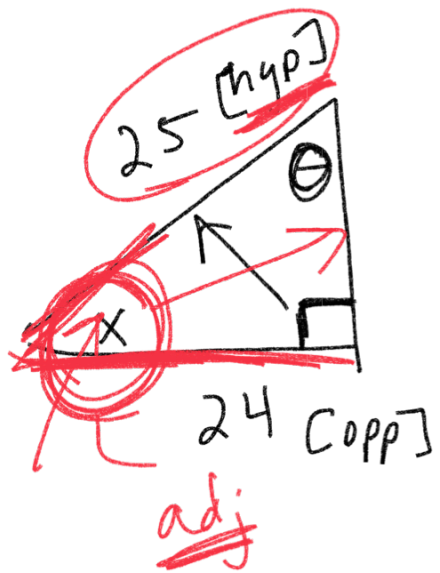
$$b (\tan 30^\circ) = \frac{X}{b}$$

$$X = b \tan 30^\circ = \boxed{3.46}$$

$$\cos \theta = \frac{b}{y}$$

$$\cos 30^\circ = \frac{b}{y}$$

$$y = \frac{b}{\cos 30^\circ} \\ \boxed{y = 6.93}$$



SOH CAH TOA

$$\sin \theta = \frac{24}{25}$$

$$\sin^{-1}\left(\frac{24}{25}\right) = \boxed{73.7^\circ}$$

$$\cos X = \frac{24}{25}$$

$$\cos^{-1}\left(\frac{24}{25}\right) = \boxed{16.3}$$