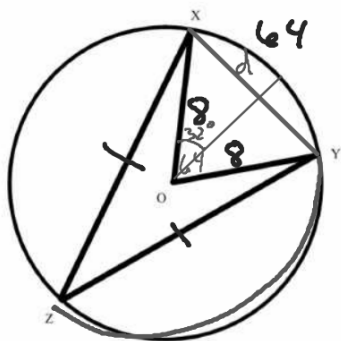


In the diagram below, the radius of the circle with center O is 8 cm, and $m\widehat{XY} = 64^\circ$. Find each of the following measures.



$$m\widehat{XZY} = 360 - 64 = 296^\circ$$

$$m\widehat{YZ} = 148^\circ$$

$$m\angle XOY = 64^\circ$$

$$m\angle XZY = 32^\circ$$

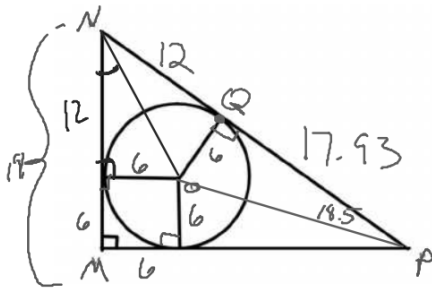
$$XY = 8.478 \text{ cm}$$



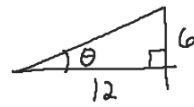
$$\sin 32^\circ = \frac{d}{8}$$

$$d = 8 \sin 32^\circ = 4.239$$

Each side of right $\triangle MNP$ is tangent to circle O. The radius of the circle is 6 cm and the length of MN is 18 cm. Find each of the following. Show your work.



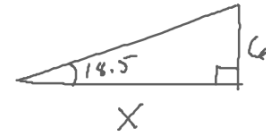
$$m\angle N = 53^\circ$$



$$\begin{aligned} \tan \theta &= \frac{6}{12} \\ \tan^{-1}\left(\frac{6}{12}\right) &= \theta \\ 26.57 &= \theta \end{aligned}$$

$$m\angle P = 37^\circ$$

$$PN = 29.93$$



$$\tan 18.5 = \frac{6}{x}$$

$$x \tan 18.5 = 6$$

$$\begin{aligned} x &= \frac{6}{\tan 18.5} \\ &= 17.93 \end{aligned}$$