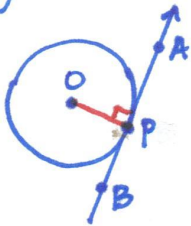


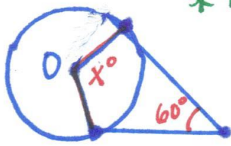
# Tangent Lines (Section 12-3)

\* Tangent to a circle: a line that intersects w/ the circle exactly once.



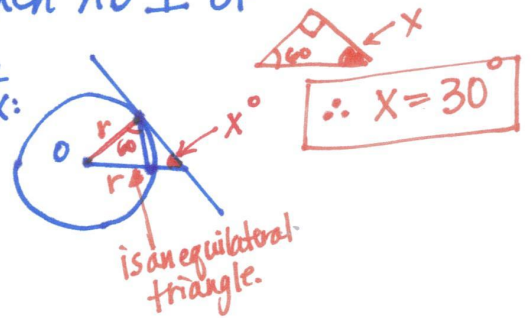
\* If  $\overleftrightarrow{AB}$  is tangent to circle O @ point P, then  $\overleftrightarrow{AB} \perp \overline{OP}$

#1 ex:

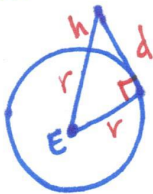


\* This forms a quadrilateral so all angles sum to  $360^\circ$   
 $60^\circ + x^\circ + 90^\circ + 90^\circ = 360$   
 $x = 120^\circ$

#2 ex:



Practice ex:



d = distance to horizon  
 r = radius of Earth  
 h = height above Earth  
 r = 6400 km

#3

a) use  $h = 1$  km, find d.

$$d^2 + r^2 = (r+h)^2$$

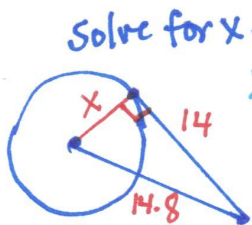
$$d^2 + (6400)^2 = (6401)^2$$

$$d^2 = 12801$$

$$d = 113.1 \text{ km}$$

\* The converse is also true: If  $\overleftrightarrow{AB} \perp \overline{OP}$  @ P, then  $\overleftrightarrow{AB}$  is tangent to circle O.

#5 ex:



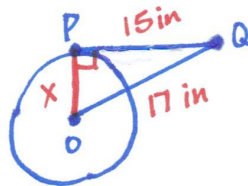
Solve for x.

$$x^2 + 14^2 = 14.8^2$$

$$x^2 = 23.04$$

$$x = 4.8$$

#6 ex:

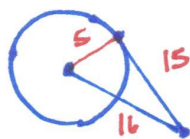


$$x^2 + 15^2 = 17^2$$

$$x^2 = 64$$

$$x = 8 \text{ in}$$

#7 ex:



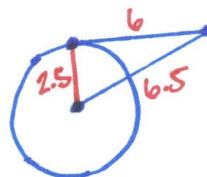
Is it a tangent?

$$5^2 + 15^2 \stackrel{?}{=} 16^2$$

$$250 \neq 256$$

$\therefore$  No!

#8 ex:

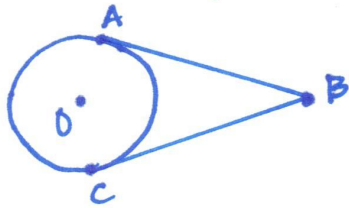


$$(2.5)^2 + 6^2 \stackrel{?}{=} (6.5)^2$$

$$42.25 = 42.25$$

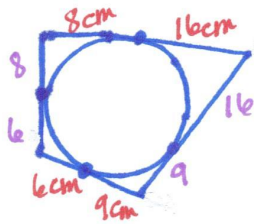
$\therefore$  yes, its a tangent!

\* If  $\overline{BA} \neq \overline{BC}$  are tangents to circle  $O$ , then  $\overline{BA} \cong \overline{BC}$ .



\* You can have a circle inscribed in a polygon & it is just multiple tangents.

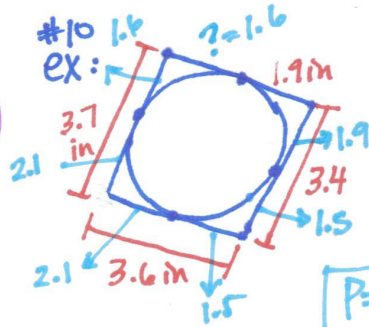
#9  
ex:



Find the perimeter:

$$P = 8(z) + 16(z) + 6(z) + 9(z)$$

$$P = 78 \text{ cm}$$



Find the perimeter:

$$P = 2(1.6 + 1.9 + 1.5 + 2.1)$$

$$P = 14.2 \text{ in}$$