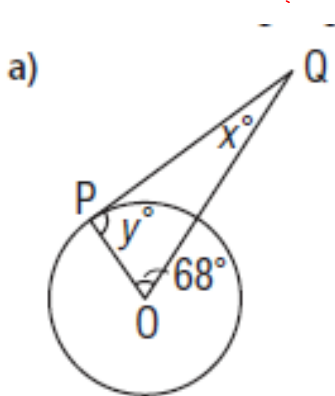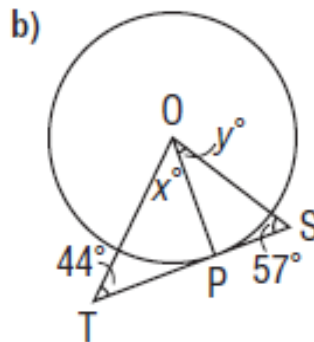## Mid-Unit Review

8.1   **1.** Point O is the centre of each circle and P is a point of tangency. Determine each value of $x°$ and $y°$.
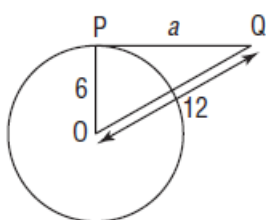Which circle properties did you use?

a)

b)

<OPT = 90° (Tang P)
<OPS =90° (Tang P)

x=46° (SATT)

x=33° (SATT)

<y=<0PQ= 90° (TangP)

x=22° (SATT)

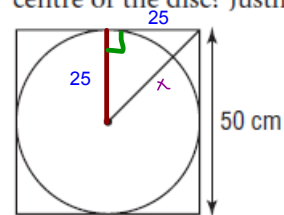**2.** Point O is the centre of a circle and point P is a point of tangency. Determine the value of a. Explain your strategy.

P a Q

6   12   0

<0PQ= 90° (TangP)

$a \Rightarrow$ leg

$a^2 = c^2 - b^2$

$a^2 = 12^2 - 6^2$

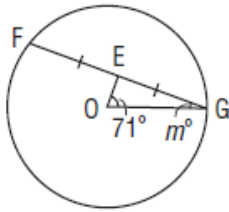$a^2 = 144 - 36$

$\sqrt{a^2} = \sqrt{108}$

$a = 10.4$

3. A metal disc is to be cut from a square sheet with side length 50 cm.
How far from a corner of the sheet is the centre of the disc? Justify your strategy.

25

25   x

50 cm

(Tang P)

$x \Rightarrow$ hyp

$c^2 = a^2 + b^2$

$c^2 = 25^2 + 25^2$

$c^2 = 625 + 625$

$\sqrt{c^2} = \sqrt{1250}$

$c = 35.4$ cm

1

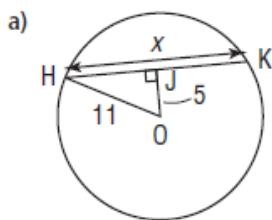**8.2**   **4.** Point O is the centre of the circle.
Determine the value of $m°$.

$\angle OEG = 90°$ (Chord P3)

$m = \angle EGO$

$m = 19°$

5. Point O is the centre of each circle.
Determine each value of x.

a)

$HJ = JK$ (chord P1)

$HJ = 2 \, kg$
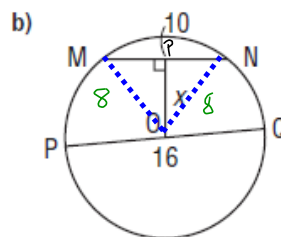
$a^2 = c^2 - b^2$

$a^2 = 11^2 - 5^2$

$a^2 = 121 - 25$

$\sqrt{a^2} = \sqrt{96}$

$a = 9.8$

$x = 2(9.8)$

$x = 19.6$
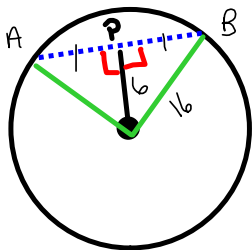
b)

$MP = NP$ (chord P)

$x = leg$

$a^2 = c^2 - b^2$

$a^2 = 8^2 - 5^2$

$a^2 = 64 - 25$

$\sqrt{a^2} = \sqrt{39}$

$a = 6.2$

2

6. A circle has diameter 32 cm. A chord AB is 6 cm from O, the centre of the circle.
  a) Sketch a diagram. ●
  b) What is the length of the chord? Which circle properties did you use to find out?

$AP = BP$

$(chord\ P123)$

$AP = leg$

$a^2 = c^2 - b^2$

$a^2 = 16^2 - 6^2$

$a^2 = 256 - 36$

$\sqrt{a^2} = \sqrt{220}$
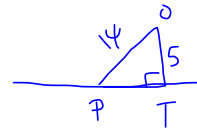
$a = 14.8\ cm$

$AB = 2(14.8)$

$= 29.6\ cm$

7. Water is flowing through a pipe with radius 14 cm. The maximum depth of the water is 9 cm. What is the width, PQ, of the surface of the water? ●
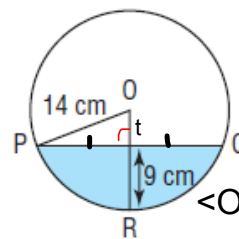
PT=TQ (Chord P123

<OPT= 90° (Chord P1,2,3)

OT = 14-9 = 5cm

$PT \Rightarrow a^2 = c^2 - b^2$

$a^2 = 14^2 - 5^2$

$a^2 = 196 - 25$

$\sqrt{a^2} = \sqrt{171}$

$a = 13.1\ cm$

$PQ = 2(13.1cm)$

$PQ = 26.2\ cm$