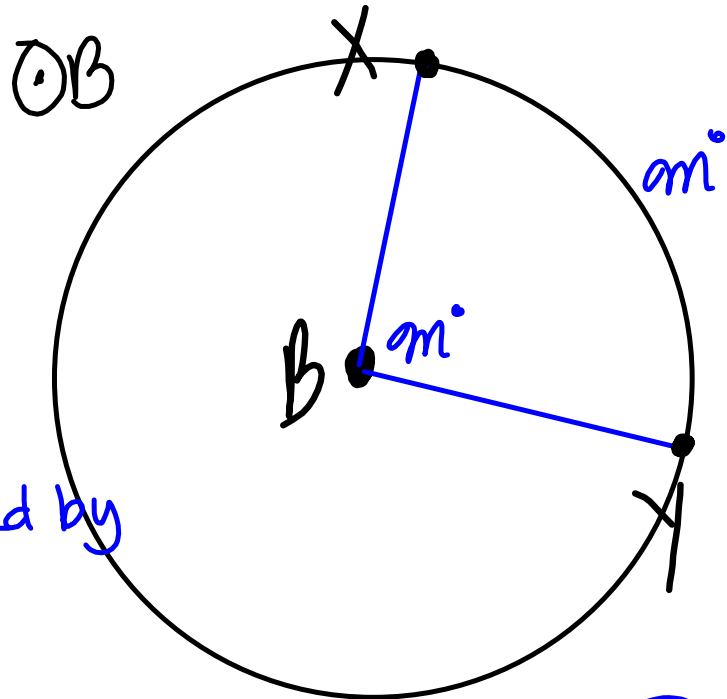


12.3 Inscribed angles

Blue angle \rightarrow
 Vertex is at the center!

Central Angle
 $\angle XBY$

Minor Arc intercepted by the central angle
 \widehat{XY}



Inscribed angle: $m\angle XBY = m\widehat{XY}$
 an angle with the vertex on the circle's edge.

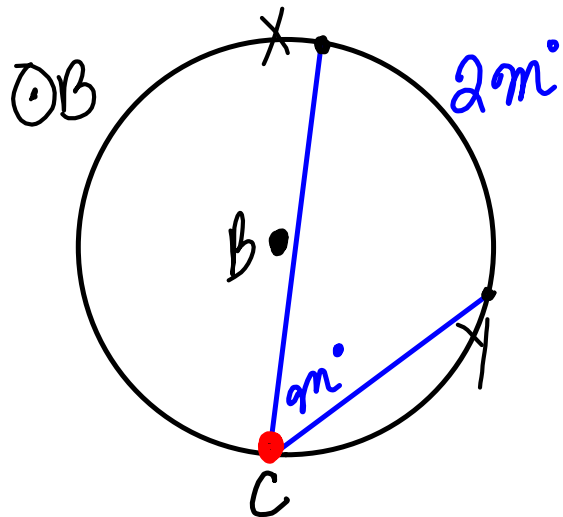
$$m\angle XCY = \frac{1}{2}m\widehat{XY}$$

or

$$m\widehat{XY} = 2m\angle XCY$$

Intercepted arc:

An arc bounded by an angle.



Ex 1

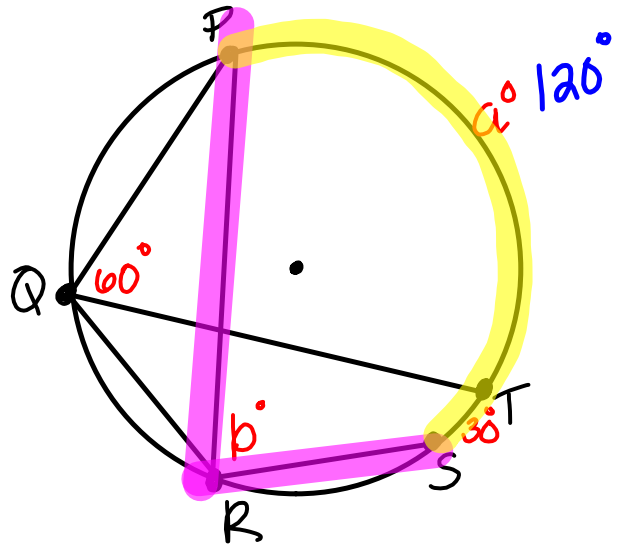
What are the values of a and b ?

$$a = 2 \times \angle PQS$$

$$a = 2 \times 60 = 120^\circ$$

$$b = \frac{1}{2}(\widehat{PS})$$

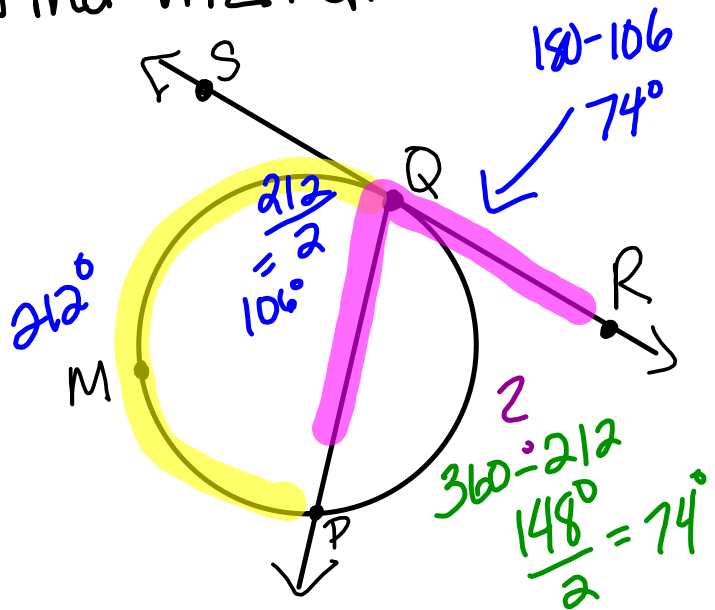
$$b = \frac{1}{2}(120^\circ + 30^\circ) = 75^\circ$$



Ex 2 | In the diagram, \overleftrightarrow{SR} is a tangent, if $m \widehat{PMQ} = 212^\circ$, find $m \angle PQR$.

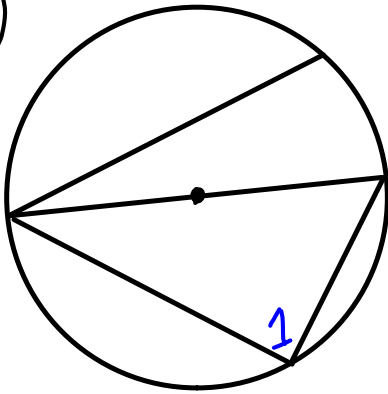
$\angle PQR$ is inscribed (Vertex is on the edge.)

$m \angle PQR = 74^\circ$



Ex 3 } What is the measure of each numbered angle?

a)

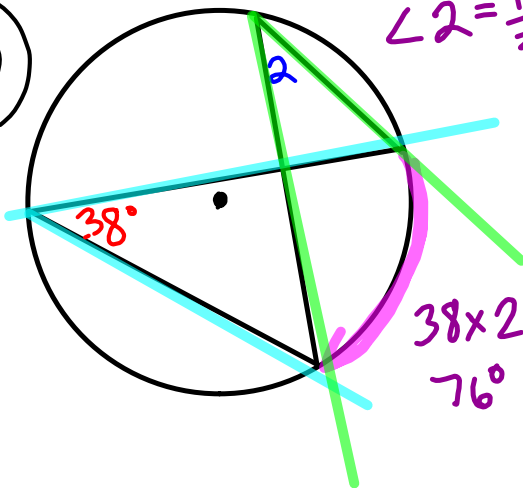


← diameter (180°)
 $m\angle 1 = \frac{1}{2}(180) = 90^\circ$

Property

Insc. \angle that intercepts Semicircle is always 90°

b)



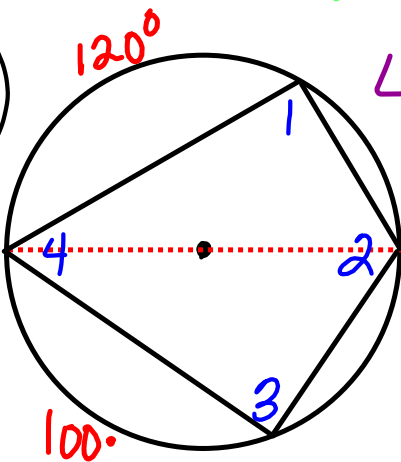
$\angle 2 = \frac{1}{2}(76) = 38^\circ$

38×2
 76°

Property

all insc. \angle 's that intercept the same arc are congruent.

c)



$\angle 1 = 90^\circ$

$\angle 2 = \frac{1}{2}(120 + 100)$

$\angle 2 = 110^\circ$

$\angle 3 = 90^\circ$

$\angle 4 = \frac{1}{2}(360 - 120 - 100) = 70^\circ$

90
 + 90
 + 110
 + 70

 360 ✓

Practice: Find each indicated measure for $\odot P$.

a) $m\angle A = \frac{1}{2}(80) = 40^\circ$

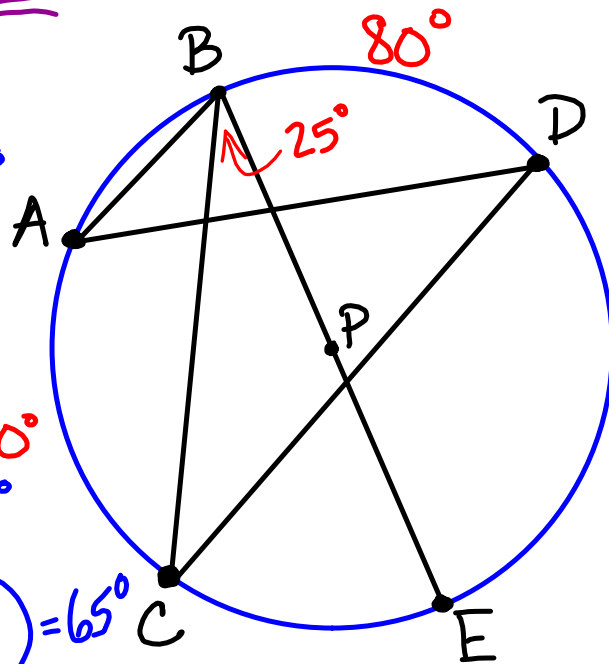
b) $m\widehat{CE} = 2(25) = 50^\circ$

c) $m\angle C = \frac{1}{2}(80) = 40^\circ$
or $\angle C \cong \angle A$

d) $m\angle D = \frac{1}{2}(80) = 40^\circ$

e) $m\angle ABE = \frac{1}{2}\left(\frac{80+50}{1}\right) = 65^\circ$

$\angle ABE = \angle ADC + \angle CBE$
 $40 + 25 = 65^\circ$



$\odot P$ indicates:
 \overline{BE} is the diameter