

10.5: Angles Related to Circles

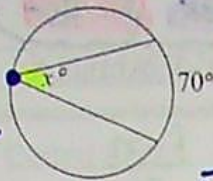
Next to each diagram, give the name of the angle shown and write down the formula used to find its measure.

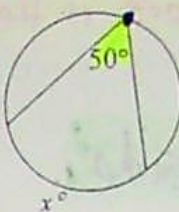
Where is the vertex? Arcs: n - near f - far

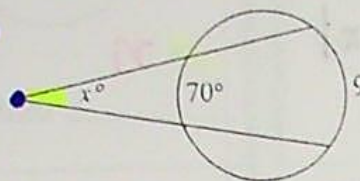
Diagram	Location of Vertex	Classification	Formula
	Outside	* tangent-tangent Δ	$\angle = \frac{f-n}{2}$ * \angle supps n
	Inside (center)	Central Δ	$\angle = n$
	ON	tangent-chord Δ tangent-secant Δ	$\angle = \frac{1}{2}n$
	Outside	secant-secant Δ	$\angle = \frac{f-n}{2}$
	inside (not center)	chord-chord Δ	$\angle = \frac{f+n}{2}$
	ON	Inscribed Δ	$\angle = \frac{1}{2}n$
	Outside	tangent-secant Δ	$\angle = \frac{f-n}{2}$

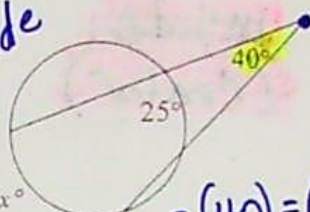
Key Question: Where's the vertex?

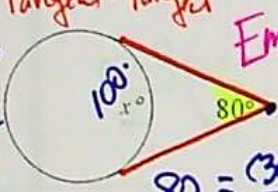
For each question, write out the appropriate formula, plug in the known values, then solve.

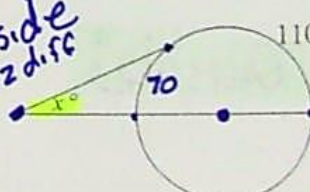
1. ON
 $\angle = \frac{1}{2} \text{arc}$

 $x = \frac{70}{2}$
 $x = 35$

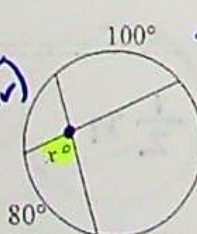
2. ON

 $2(50) = \left(\frac{x}{2}\right)2$
 $100 = x$

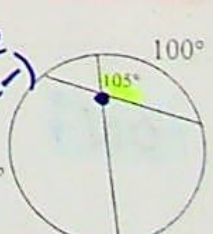
3. Outside
 $(\angle = \frac{1}{2} \text{diff})$

 $x = \frac{90 - 70}{2} = \frac{20}{2}$
 $x = 10$

4. Outside

 $2(40) = \left(\frac{x - 25}{2}\right)2$
 $25 + 80 = x - 25$
 $105 = x$

* 5. Outside
 $360 - x$
 tangent-tangent
 Emily's Problem

 $80 = \frac{(360 - x) - x}{2}$
 $2(80) = \frac{(360 - 2x)}{2}2$
 $160 = \frac{360 - 2x}{2}2$
 $-320 \quad -360$
 $-200 = -2x$
 $-2 \quad -2$
 $100 = x$

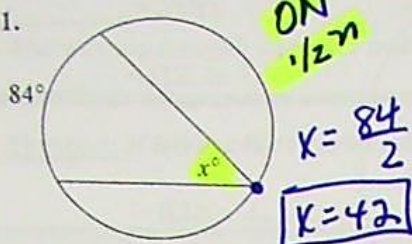
6. Outside
 $\angle = \frac{1}{2} \text{diff}$

 $x = \frac{110 - 70}{2} = \frac{40}{2} = 20$

7. Inside
 (not center)
 $\angle = \frac{1}{2} \text{sum}$

 $x = \frac{100 + 80}{2}$
 $= \frac{180}{2}$
 $= 90$

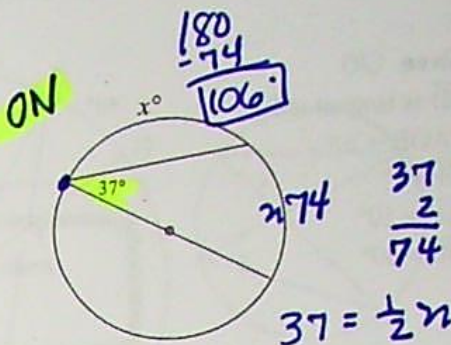
8. Inside
 (not center)
 $\angle = \frac{1}{2} \text{sum}$

 $\frac{1}{2} \left(\frac{x + 100}{2}\right)2 = (105)2$
 $x + 100 = 210$
 $-100 \quad -100$
 $x = 110$

Examples: Find x.

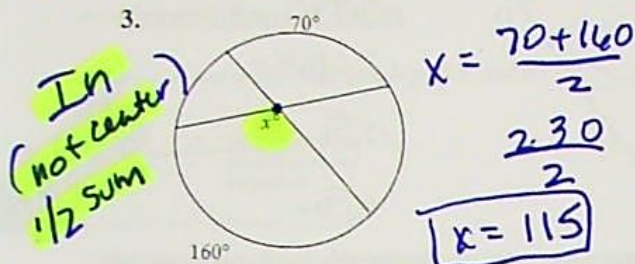
1.



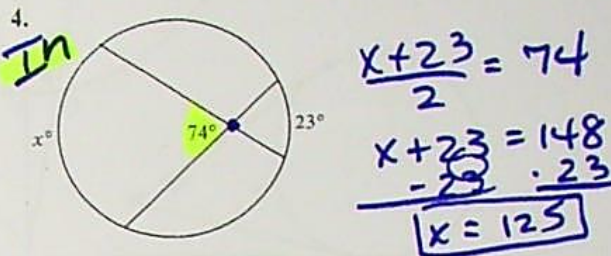
2.



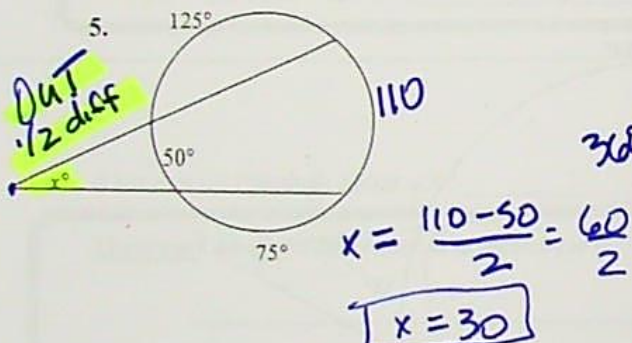
3.



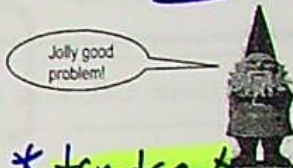
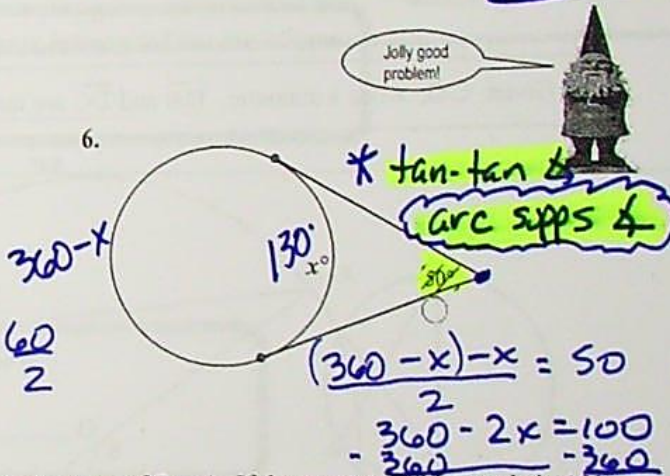
4.



5.

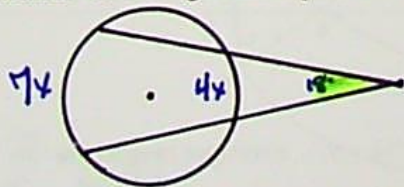


6.



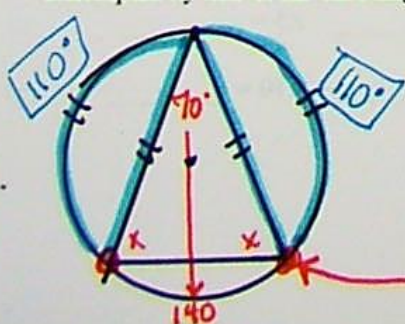
7. A secant-secant angle intercepts two arcs in the ratio of 7 to 4. If the measure of the angle is 18° , find the measure of the larger intercepted arc.

Outside
 $x = \frac{a-b}{2}$



$\frac{7x - 4x}{2} = 18$
 $7x - 4x = 36$
 $3x = 36$
 $x = 12$
Lg arc
 $7(12)$
 84°
 $-\frac{2x}{-2} = \frac{-260}{-2}$
 $x = 130$

8. An isosceles triangle with a vertex angle of 70° is inscribed in a circle. Find the measure of an arc intercepted by one of the base angles of the triangle.



$180 - 70 = 110$
 $2x = 110$
 $x = 55$
Arc = $2x = 110^\circ$
27 inscribed, vertex ON