

Circle Theorems (Angles, Chords, and Tangents)

Topic: Vocabulary	Things to Remember: ✓ Notation is VERY important
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Examples:

1. What is a LINE that goes through the circle at two points?

Secant

2. What line segment goes from the center to the outside of the circle?

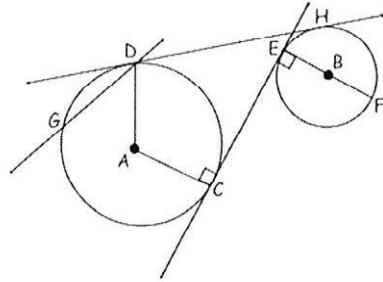
radius

3. Name TWO common tangents.

\longleftrightarrow \longleftrightarrow
DH, CE

4. Name a secant and a chord using the same letters.

\longleftrightarrow $\overline{\hspace{1cm}}$
GD DG



Topic: Central Angles	Things to Remember: ✓ Arc = Angle
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Examples:

5.

$4x + 3x + 26 = 180$
 $7x + 26 = 180$
 $-26 \quad -26$
 $\frac{7x = 154}{7} \quad \frac{\hspace{1cm}}{7}$
 $x = 22$

$m\widehat{BC} = ? 88^\circ$

$m\widehat{AC} = ? 92^\circ$

6.

vertical angles
 $4x - 5 = 2x + 65$
 $-2x \quad -2x$
 $2x - 5 = 65$
 $+5 \quad +5$
 $\frac{2x = 70}{2} \quad \frac{\hspace{1cm}}{2}$
 $x = 35$

$m\widehat{AC} = ? 135^\circ$

$m\widehat{BC} = ? 45^\circ$

Topic: "ON"/Inscribed Angles	Things to Remember: ✓ $\frac{1}{2}$ Arc = Angle
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Examples:

7. $m\angle BAC = 66^\circ$

"ON"
 Central

8. Solve for x.

"ON"
 $360^\circ - 208^\circ = 152^\circ$
 $152^\circ = x^\circ$

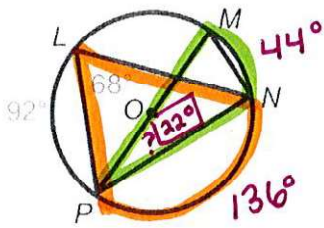
9. If Arc CB = 120° , solve for $m\angle DCB$

$\frac{360^\circ - 120^\circ}{2} = 120^\circ$
 120°

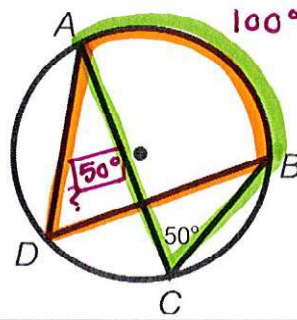
10. Solve for all variables.

opposite angles in an inscribed quadrilateral = 180°
 164°

11. Solve for $m\angle MPN$



12. Solve for $m\angle ADB$



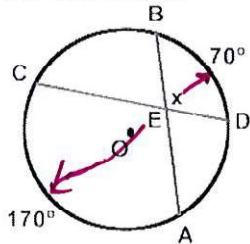
Topic: "IN" Angles

Things to Remember:

$$\checkmark \frac{\text{big arc} + \text{small arc}}{2} = \text{angle}$$

Examples:

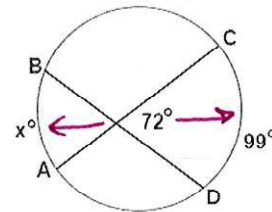
13. Solve for x.



$$\frac{170^\circ + 70^\circ}{2} = x$$

$$\boxed{120^\circ = x}$$

14. Solve for x.



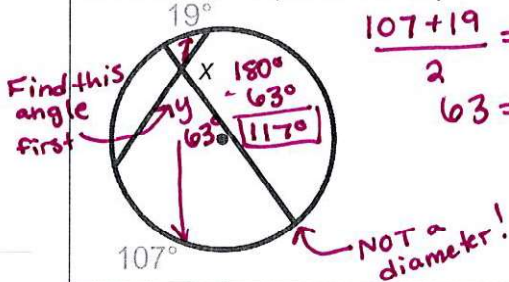
$$\frac{99^\circ + x}{2} = \frac{72^\circ}{1}$$

$$99 + x = 144$$

$$-99 \quad -99$$

$$\boxed{x = 45^\circ}$$

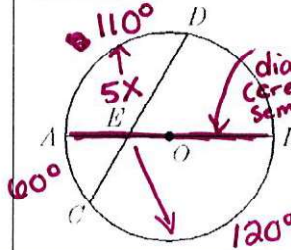
15. Solve for x. (BE CAREFUL!)



$$\frac{107^\circ + 19^\circ}{2} = y$$

$$63 = y$$

16. Angle DEA = 5x, Arc DA = 110°, Arc AC = 60°. Solve for x.



$$\frac{120^\circ + 110^\circ}{2} = \frac{5x}{1}$$

$$\frac{230}{10} = \frac{10x}{10}$$

$$\boxed{23 = x}$$

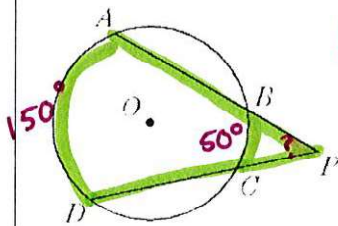
Topic: "OUT" angles

Things to Remember:

$$\checkmark \frac{\text{big arc} - \text{small arc}}{2} = \text{angle}$$

Examples

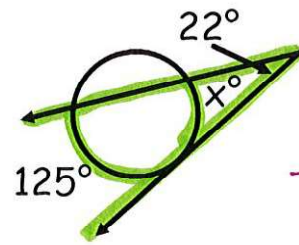
17. Find $m\angle APD$ if $m\widehat{AD} = 150^\circ$ and $m\widehat{BC} = 50^\circ$



$$\frac{150^\circ - 50^\circ}{2} = x$$

$$\boxed{50^\circ = x}$$

18.



$$\frac{125^\circ - x}{2} = \frac{22^\circ}{1}$$

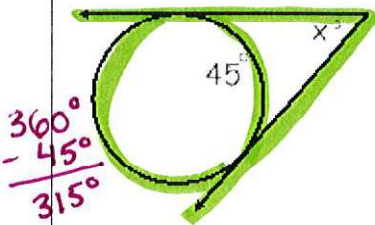
$$44 = 125 - x$$

$$-125 \quad -125$$

$$-81 = -x$$

$$81 = x$$

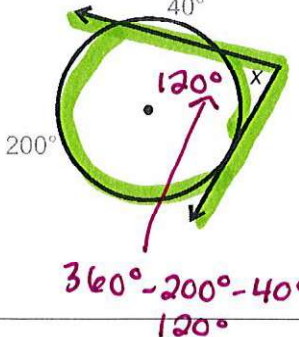
19. Solve for x.



$$\frac{315^\circ - 45^\circ}{2} = x$$

$$\boxed{135^\circ = x}$$

20. Solve for x.



$$\frac{200^\circ - 120^\circ}{2} = x$$

$$\boxed{40^\circ = x}$$

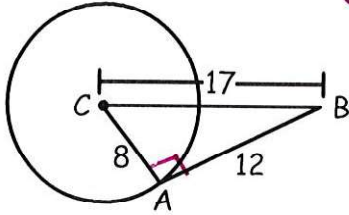
Topic: Tangent Theorems

Things to Remember:

- ✓ Radius and tangents meet at a RIGHT angle
- ✓ Tangents that go to the same circle and same point are CONGRUENT

Examples

21. Is \overline{AB} tangent to $\odot C$? Explain your reasoning. Show work!

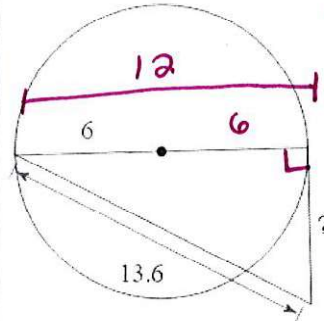


$$(8)^2 + (12)^2 = (17)^2$$

$$208 \neq 289$$

No!

22. Solve for the radius if the lines that appear tangent are tangent.



$$(12)^2 + (x)^2 = (13.6)^2$$

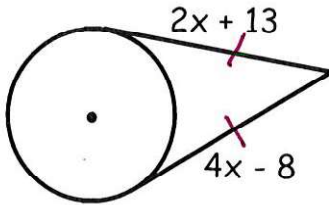
$$144 + x^2 = 184.96$$

$$-144 \quad -144$$

$$\sqrt{x^2} = \sqrt{40.96}$$

$$x = 6.4$$

23. Solve for x.



$$2x + 13 = 4x - 8$$

$$-2x \quad -2x$$

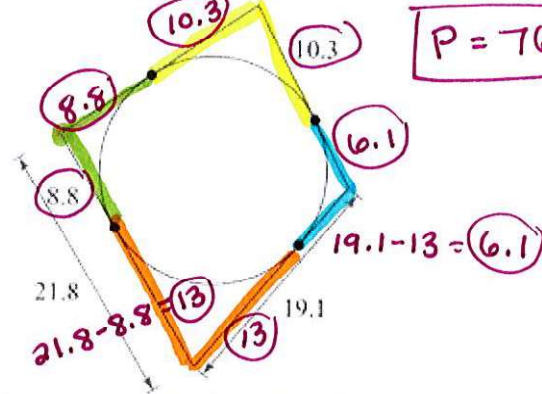
$$13 = 2x - 8$$

$$+8 \quad +8$$

$$\frac{21}{2} = \frac{2x}{2}$$

$$10.5 = x$$

24. Find the perimeter.



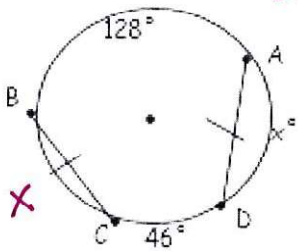
$$P = 76.4$$

Topic: Chords

Things to Remember:

- ✓ Congruent arcs = congruent chords
- ✓ If a diameter/radius is perpendicular to a chord, the chord is bisected
- ✓ If two chords are equidistant (same distance), the chords are congruent.

25. Solve for x.



$$2x + 128 + 46 = 360$$

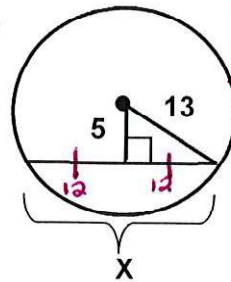
$$2x + 174 = 360$$

$$-174 \quad -174$$

$$\frac{2x}{2} = \frac{186}{2}$$

$$x = 93$$

26. Solve for x.



$$(5)^2 + b^2 = (13)^2$$

$$25 + b^2 = 169$$

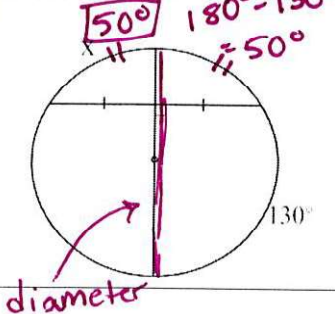
$$-25 \quad -25$$

$$\sqrt{b^2} = \sqrt{144}$$

$$b = 12$$

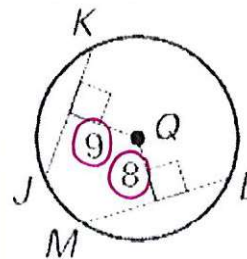
$$x = 24$$

27. Solve for x.



diameter

28. Are chords JK and ML congruent? Why or why not?



No, the chords are not the same distance from the center