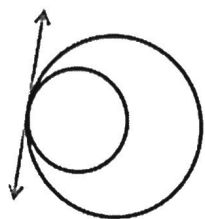


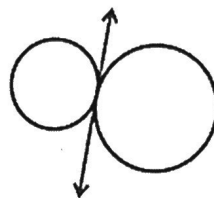
Tangent and Chord Properties

On Day 1, you learned that tangent lines intersect a circle in exactly one place. This leads to several theorems about tangent lines.

Tangent Circles are two coplanar circles that intersect at exactly one point. They may intersect internally or externally.

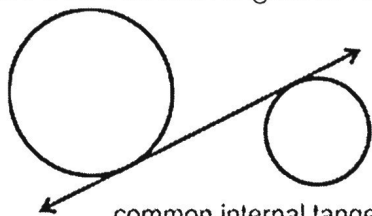


internally tangent

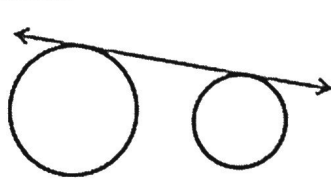


externally tangent

Common Tangent Lines are lines that are tangent to two circles.

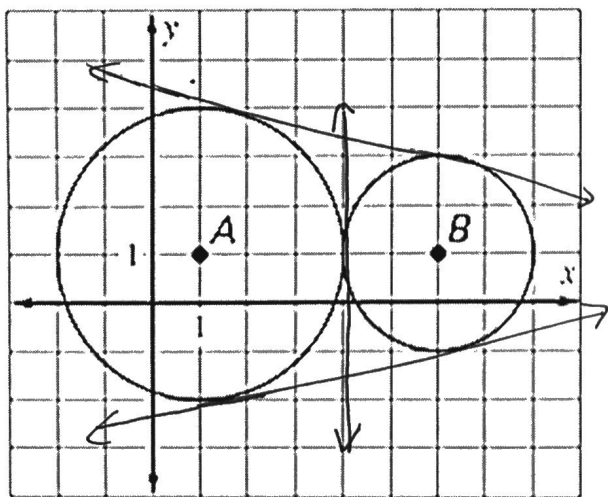


common internal tangent



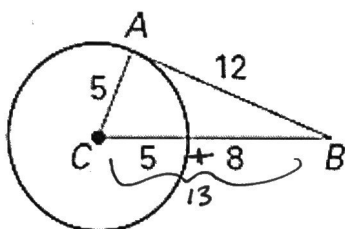
common external tangent

Example: Draw any common tangent lines.



Name	Theorem	Hypothesis	Conclusion
Perpendicular Tangent Theorem	If a line is tangent to a circle, then it is <u>perpendicular</u> to the <u>radius drawn to the point of tangency</u> .		$\overline{AD} \perp \overline{FD}$
Converse of Perpendicular Tangent Theorem	If a line is perpendicular to a radius of a circle at a point on the circle, then the line is tangent to the circle.		

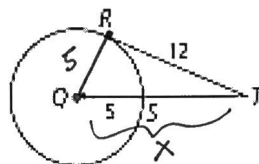
Example: Is AB tangent to Circle C?



$$5^2 + 12^2 = 13^2$$

yes - tangent
b/c this is a right Δ

Example: Find ST.



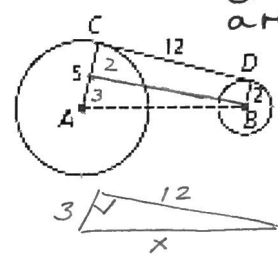
$$5^2 + 12^2 = X^2$$

$$169 = X^2$$

$$13 = X$$

$$13 - 5 = \overline{ST} = 8$$

Example: Find AB.



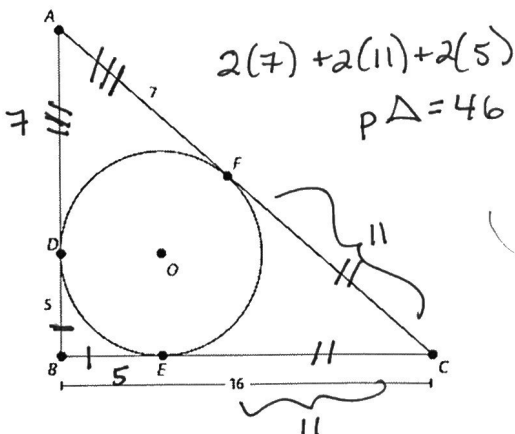
Creates a rectangle

$$3^2 + 12^2 = X^2$$

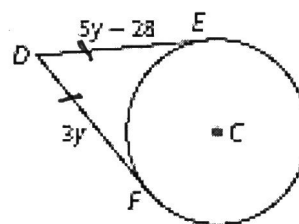
$$X \approx 12.4$$

Name	Theorem	Hypothesis	Conclusion
Tangent Segments Theorem	If two segments are tangent to a circle from the same external point, then the segments are congruent.		$\overline{GC} \cong \overline{GB}$

Example: Find perimeter of triangle ABC.



Example: Find DF if you know that DF and DE are tangent to $\odot C$.



$$3y = 5y - 28$$

$$-2y = -28$$

$$y = 14$$

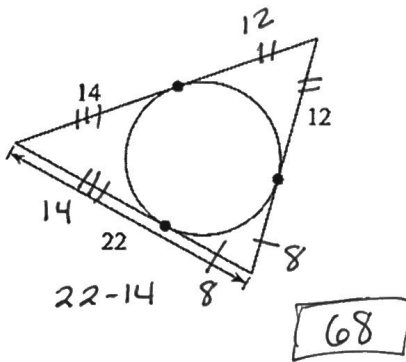
$$DE = 5(14) - 28$$

$$DE = 42$$

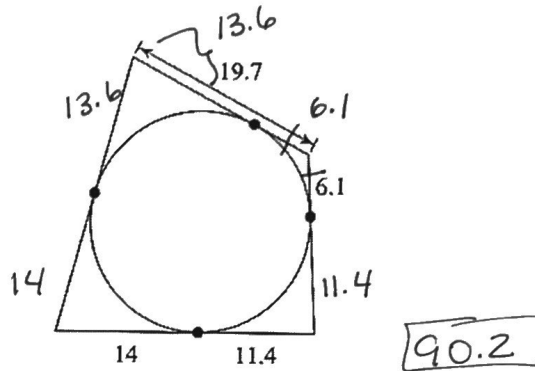
Day 4 Tangent & Chord Properties

For problems 1-2, find the perimeter of each polygon.

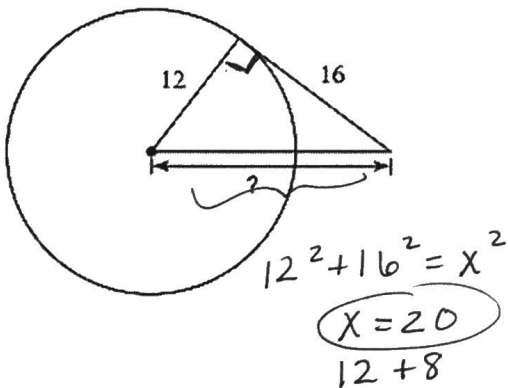
1.



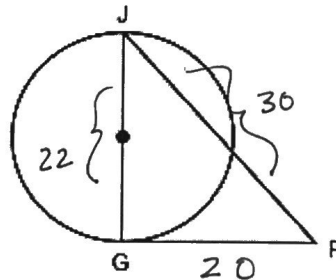
2.



3. Find the missing segment length.

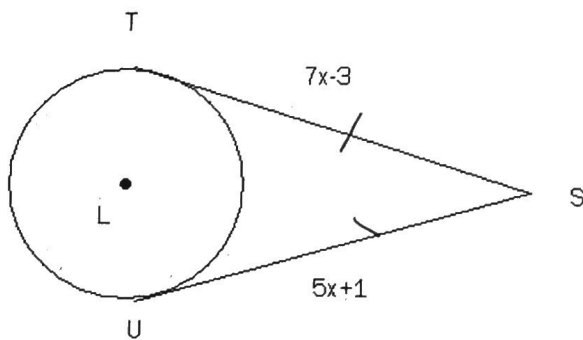


4. JG is the diameter of the circle whose radius is 11. If PG = 20 and JP = 30, is GP tangent to the circle?



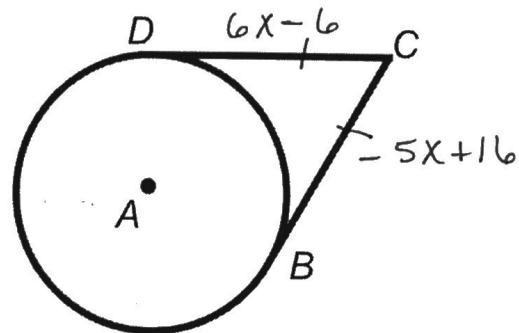
$22^2 + 20^2 = 30^2$
 $884 \neq 900$
not tangent
- no right angle!

5. Solve for x.



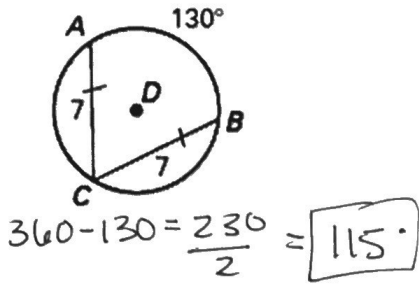
$7x - 3 = 5x + 1$
 $2x = 4$
 $x = 2$

6. Given $CD = 3(2x-2)$ and $CB = -5x+16$, find mCD.

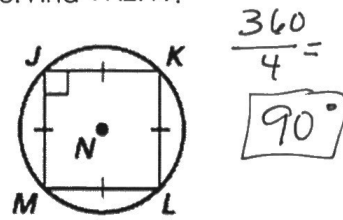


$6x - 6 = -5x + 16$
 $11x = 22$
 $x = 2$
 $mCD = 6(2) - 6 = 6$

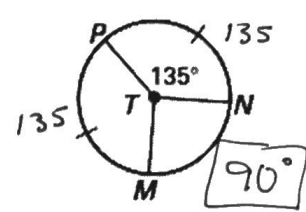
7. Find $m\widehat{AC}$.



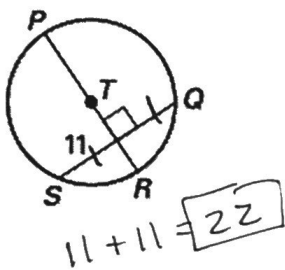
8. Find $m\widehat{LM}$.



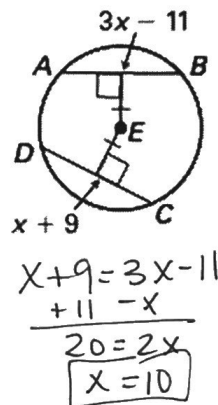
9. Find $m\widehat{MN}$.



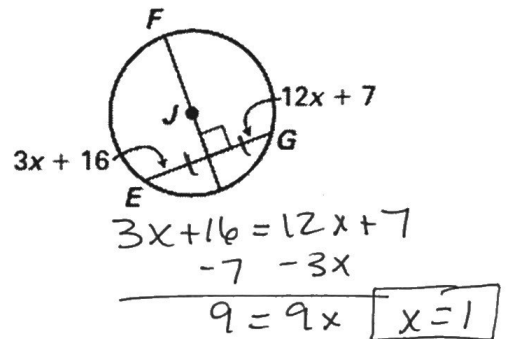
10. Find QS.



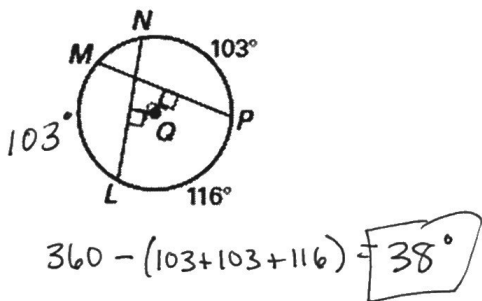
11. Solve for x.



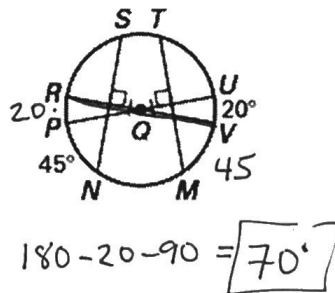
12. Solve for x.



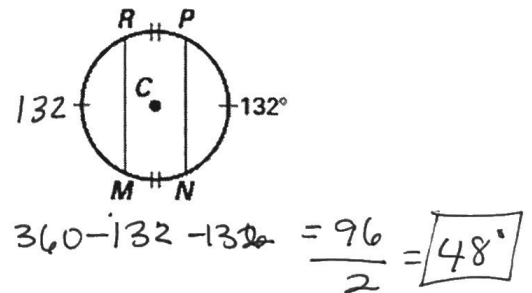
13. Find $m\widehat{MN}$.



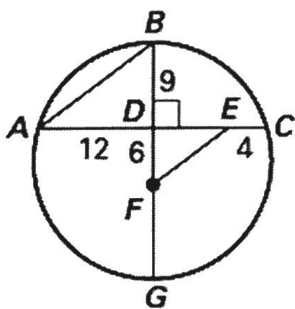
14. Find $m\widehat{MN}$.



15. Find $m\widehat{MN}$.



16. Prove $\triangle ABD \sim \triangle EFD$



$\frac{AB}{EF} = \frac{BD}{FD} = \frac{AD}{ED}$

$\frac{9}{6} = \frac{12}{x}$

$9x = 72$

$x = 8$

$8 + 4 = 12$

SAS \sim

$\angle BDA \cong \angle FDC$

$\frac{9}{6} = \frac{12}{8}$

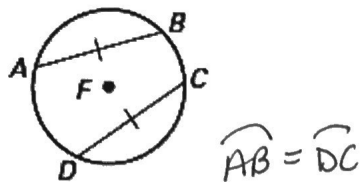
$AD = DC$
 $12 = 12$

Name: _____ Date: _____

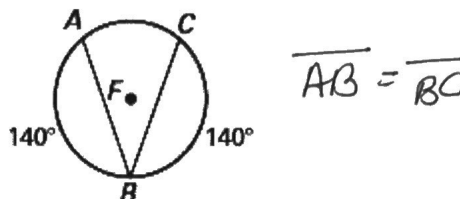
Chord Properties

1-2. What can you conclude from the following pictures?

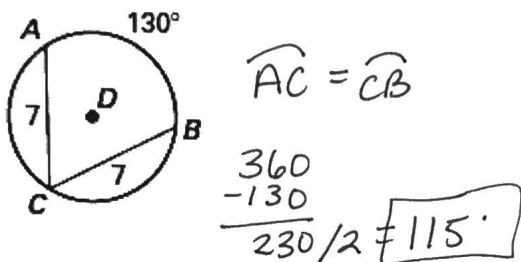
1.



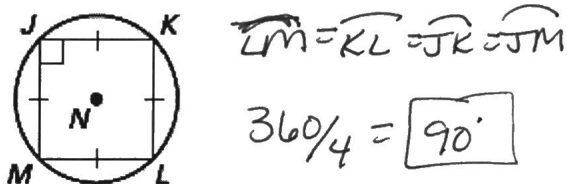
2.



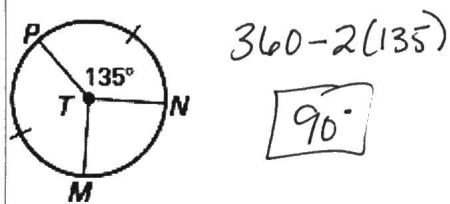
3. Find $m\widehat{AC}$.



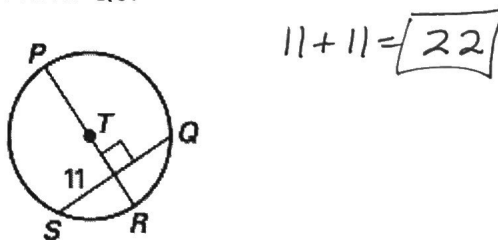
4. Find $m\widehat{LM}$.



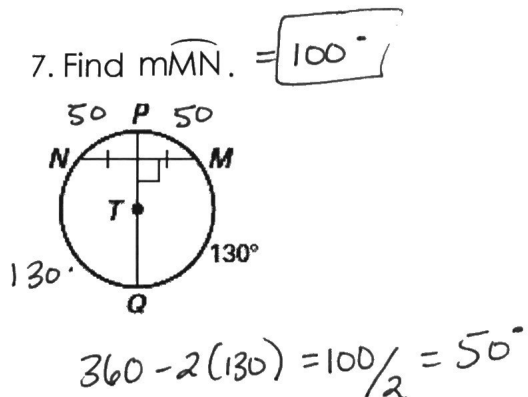
5. Find $m\widehat{MN}$.



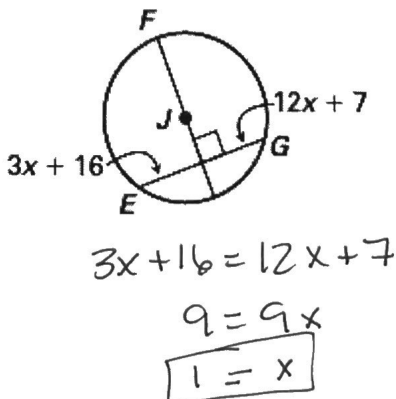
6. Find QS.



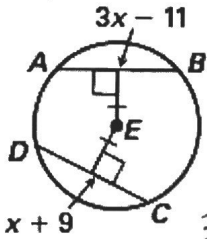
7. Find $m\widehat{MN}$.



8. Solve for x.



9. Solve for x.

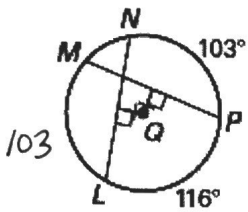


$$3x - 11 = x + 9$$

$$2x = 20$$

$$x = 10$$

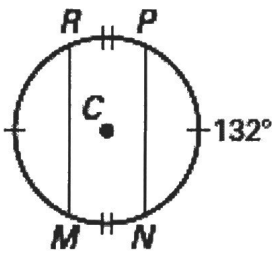
11. Find $m\widehat{MN}$.



$$360 - 2(103) - 116$$

$$38^\circ$$

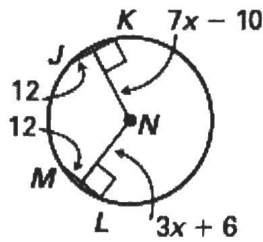
13. Find $m\widehat{MN}$.



$$360 - 2(132) = 96$$

$$96/2 = 48^\circ$$

10. Solve for x.

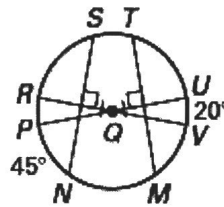


$$7x - 10 = 3x + 6$$

$$4x = 16$$

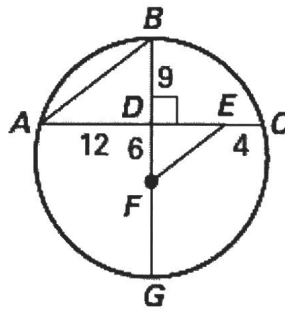
$$x = 4$$

12. Find $m\widehat{MN}$.



$$180 - 20 - 2(45) = 70^\circ$$

14. Prove $\triangle ABD \sim \triangle EFD$



$$\angle ADB \cong \angle CDF$$

$$\frac{AD}{ED} = \frac{BD}{FD}$$

$$\frac{12}{x} = \frac{9}{6}$$

$$72 = 9x$$

$$8 = x$$

$$8 + 4 = 12 \checkmark$$