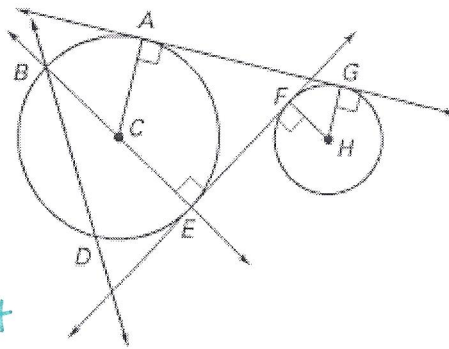


State the best term for the figure in the diagram:

1. F **Point of Tangency**
2. \overline{FE} **Common Int. Tangent**
3. \overline{HG} **Radius**
4. \overline{DB} **chord**
5. C **center**
6. \overline{BE} **diameter**
7. \overline{DB} **Secant**
8. \overline{AG} **common ext. Tangent**



Word Bank:
center, radius, diameter, common internal tangent,
common external tangent, chord, secant, point of tangency

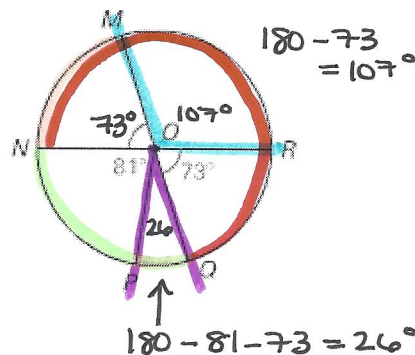
\overline{MQ} and \overline{NR} are diameters of $\odot O$. Find the indicated measure.

9. $\angle POQ = 26^\circ$
central \angle

10. $\widehat{MN} = 73^\circ$

11. $\widehat{NQ} = 81 + 26 = 107^\circ$

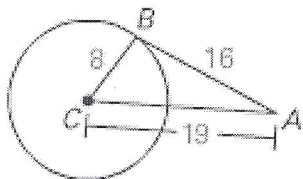
12. $\widehat{QRN} = 73 + 107 + 73 = 253^\circ$



13. $\angle MOR = 107^\circ$
central \angle

*Central \angle = the arc measure

14. In the diagram, \overline{BC} is a radius of $\odot C$. Determine whether \overline{AB} is tangent to $\odot C$. Explain your reasoning.



check Pythagorean Theorem

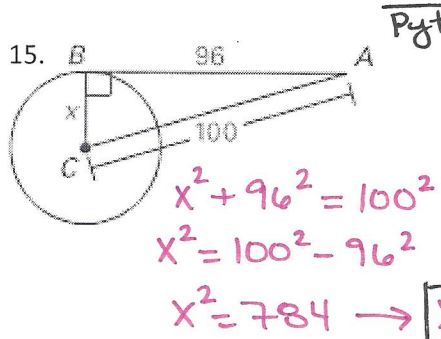
$$a^2 + b^2 = c^2$$

$$8^2 + 16^2 = 19^2$$

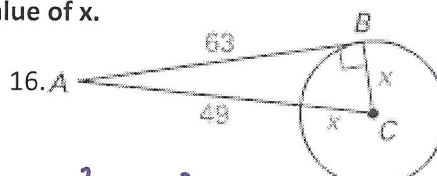
$$320 \neq 361$$

→ NO, AB is not tangent.

\overline{BC} is a radius of $\odot C$ and \overline{AB} is a tangent to $\odot C$. Find the value of x.



Pythagorean Thm.



$$x^2 + 63^2 = (x + 48)^2 \leftarrow \text{FOIL}$$

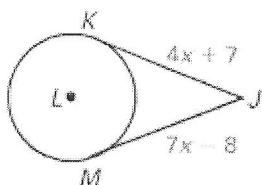
$$x^2 + 3969 = x^2 + 98x + 2401$$

$$3969 = 98x + 2401$$

$$1568 = 98x$$

$$\boxed{16 = x}$$

17. The points K and M are points of tangency. Find the value(s) of x.



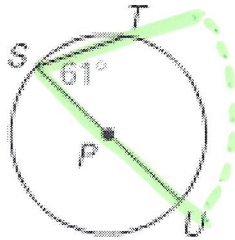
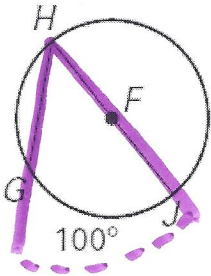
$$4x + 7 = 7x - 8$$

$$15 = 3x$$

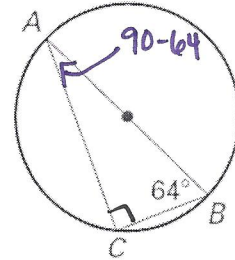
$$\boxed{5 = x}$$

Find the indicated measure.

18. $\angle GHJ = \frac{1}{2}(100) = 50^\circ$ 19. $\widehat{TU} = \frac{2(61)}{1} = 122^\circ$



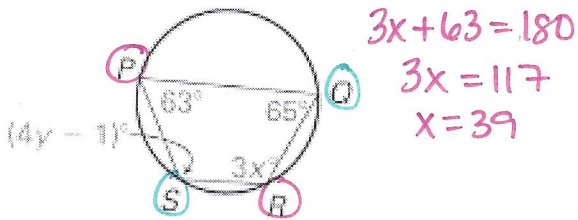
20. $\angle A = 26^\circ$, $\angle C = 90^\circ$



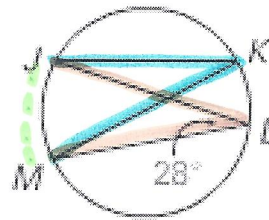
*Right Δ because \overline{AB} is the diameter.

21. $x = 39$, $y = 29$

22. $\angle k = 28^\circ$, $\widehat{JM} = \frac{2(28)}{1} = 56^\circ$



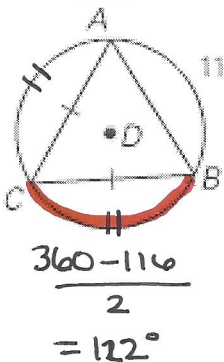
$$\begin{aligned} 3x + 63 &= 180 \\ 3x &= 117 \\ x &= 39 \\ 4y - 1 + 65 &= 180 \\ 4y + 64 &= 180 \\ 4y &= 116 \\ y &= 29 \end{aligned}$$



* $\angle K$ and $\angle L$ both touch \widehat{JM} , so they are equal.

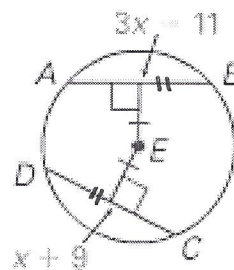
23. $\widehat{BC} = 122^\circ$

24. $x = 10$



*Because $\overline{AC} = \overline{CB}$, \widehat{AC} is also equal to \widehat{CB} .

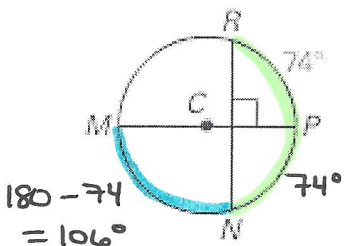
$$\frac{360 - 116}{2} = 122^\circ$$



$$\begin{aligned} 3x - 11 &= x + 9 \\ 2x &= 20 \\ x &= 10 \end{aligned}$$

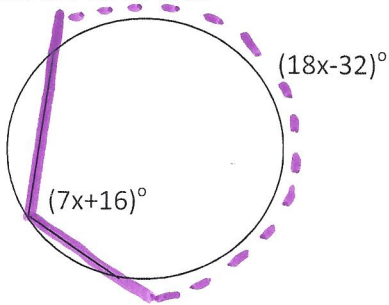
*Because they are the same distance from the center, $\overline{AB} = \overline{CD}$.

25. $\widehat{RN} = 148^\circ$, $\widehat{MN} = 106^\circ$



$$180 - 74 = 106^\circ$$

26. Find the value of x.



$$2(7x + 16) = 18x - 32$$

$$14x + 32 = 18x - 32$$

$$64 = 4x$$

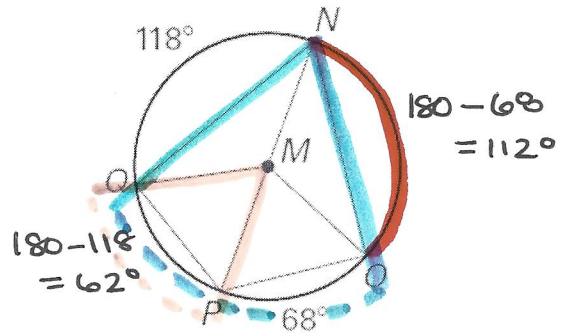
$$16 = x$$

Use the diagram to find the indicated measure.

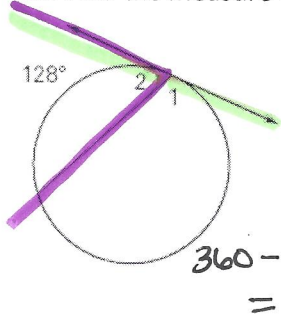
27. $\angle QMP = 62^\circ$ (central \angle)

28. $\widehat{ON} = 112^\circ$

29. $\angle ONQ = \frac{62 + 68}{2} = 65^\circ$



30. Find the measure of each numbered angle.



$$\angle 2 = \frac{1}{2}(128)$$

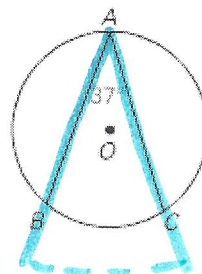
$$\angle 2 = 64^\circ$$

$$\angle 1 = 180 - 64$$

$$\angle 1 = 116^\circ$$

$$360 - 128 = 232^\circ$$

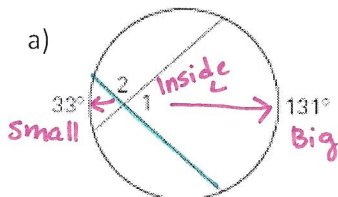
31. Find the measure of \widehat{BC} .



$$\widehat{BC} = 2(37)$$

$$= 74^\circ$$

32. Find the measure of $\angle 1$ and $\angle 2$.



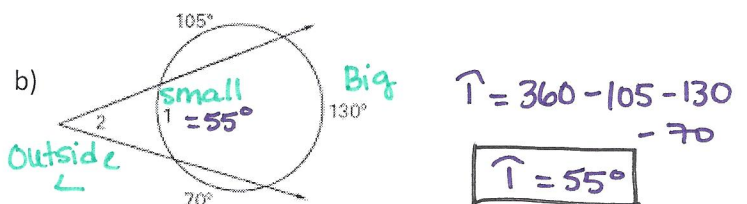
Inside $\angle = \frac{1}{2}(B + s)$

$$\angle 1 = \frac{1}{2}(131 + 33)$$

$$\angle 1 = 82^\circ$$

$$\angle 2 = 180 - 82$$

$$\angle 2 = 98^\circ$$



Outside $\angle = \frac{1}{2}(B - s)$

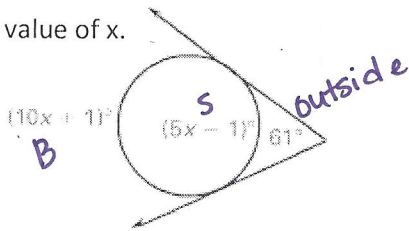
$$\angle 2 = \frac{1}{2}(130 - 55)$$

$$\angle 2 = 37.5^\circ$$

$$\hat{1} = 360 - 105 - 130 - 70$$

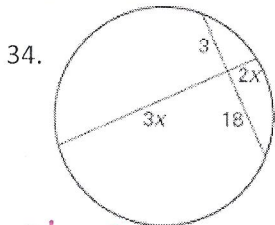
$$\hat{1} = 55^\circ$$

33. Find the value of x.

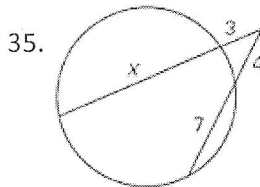


outside $\angle = \frac{1}{2}(B - s)$
 $61 = \frac{1}{2}(10x + 1 - (5x - 1))$
 $2 \cdot 61 = \frac{1}{2}(5x + 2) \cdot 2 \rightarrow 120 = 5x + 2$
 $122 = 5x + 2$
 $120 = 5x$
 $24 = x$

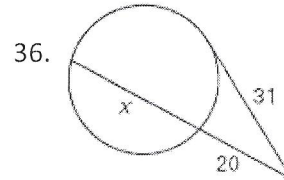
Find the value of x.



$p_1 \cdot p_2 = p_1 \cdot p_2$
 $3 \cdot 18 = 3x \cdot 2x$
 $54 = 6x^2$
 $9 = x^2$
 $3 = x$

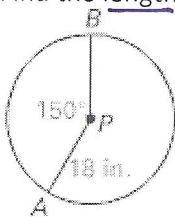


$w \cdot o = w \cdot o$
 $(x + 3)3 = 11 \cdot 4$
 $3x + 9 = 44$
 $3x = 35$
 $x = \frac{35}{3}$



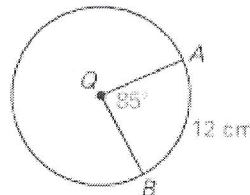
$\tan^2 = w \cdot o$
 $31^2 = (x + 20)20$
 $961 = 20x + 400$
 $561 = 20x$
 $28.05 = x$

37. Find the length of \widehat{AB}



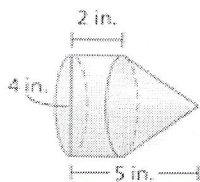
length = $\frac{\text{arc}}{360} \cdot 2\pi r$
 $= \frac{150}{360} \cdot 2\pi(18)$
 $= 15\pi \text{ in.}$

38. Find the area of the sector AQB.



Sector = $\frac{\text{arc}}{360} \cdot \pi r^2$
 $= \frac{85}{360} \cdot \pi(12)^2$
 $= 34\pi \text{ cm}^2$

39. Find the volume of the composite figure



Cylinder $\rightarrow V = Bh$
 $V = Bh$
 \downarrow
 πr^2
 $V = \pi(2)^2(4) = 8\pi$

Cone $\rightarrow V = \frac{1}{3}Bh$
 $V = \frac{1}{3}Bh$
 \downarrow
 πr^2
 $V = \frac{1}{3}\pi(2)^2(3) = 4\pi$

composite
 $\rightarrow 8\pi + 4\pi = 12\pi \text{ in}^3$

Formulas you HAVE to know:

Inside \angle : $\frac{1}{2}(B + s)$

Outside \angle : $\frac{1}{2}(B - s)$

Two Chords: $p_1 \cdot p_2 = p_1 \cdot p_2$

Two Secants: $w \cdot o = w \cdot o$

Tangent & Secant: $\tan^2 = w \cdot o$

Area of Sector: $\frac{\text{arc}}{360} \cdot \pi r^2$

Arc Length: $\frac{\text{arc}}{360} \cdot 2\pi r$