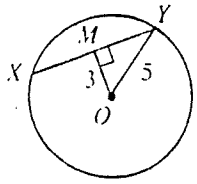
ARCS & CHORDS thm

KEY

Try these examples.

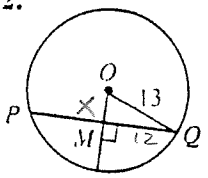
In the diagrams that follow, O is the center of the circle.

A **1.**



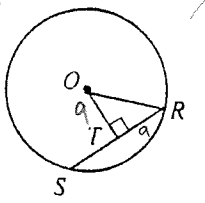
XY = ? 8

2.



$PQ = 24$; OM = ? 5

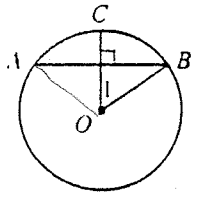
3. 45-45-90 Δ



$OT = 9$; $RS = 18$
OR = ? $9\sqrt{2}$

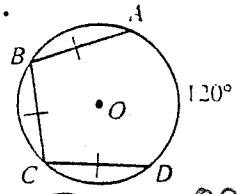
(2) $x^2 + 12^2 = 13^2$

4.



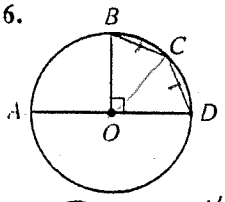
$m\overset{\frown}{ACB} = 110$;
$m\angle 1$ = ? $55°$

5.



$m\overset{\frown}{BC}$ = ? 80

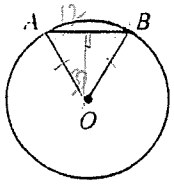
6.



$m\overset{\frown}{CD}$ = ? 45

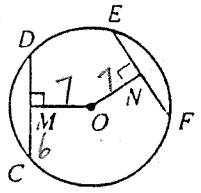
(5) $\frac{240}{3} = 80$

7.



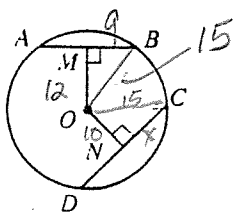
$m\angle AOB = 60$;
$AB = 24$; OA = ? 24

8.



$OM = ON = 7$;
$CM = 6$; EF = ? 12

9.



$AB = 18$; $OM = 12$;
$ON = 10$; CD = ? $10\sqrt{5}$

(9) $10^2 + x^2 = 15^2$
$x^2 = 225 - 100$
$x = \sqrt{125} = 5\sqrt{5}$

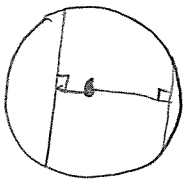
10. Sketch a circle with two noncongruent chords. Is the longer chord farther from the center or closer to the center than the shorter chord? CLOSER

11. Sketch a circle O with radius 10 and chord $\overline{XY}$ 8 cm long. How far is the chord from O? $2\sqrt{21}$ units

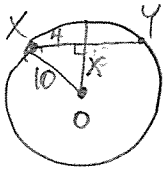
12. Sketch a circle Q with a chord $\overline{RS}$ that is 16 cm long and 2 cm from Q. What is the radius of $\odot Q$? $2\sqrt{17}$ units

13. Sketch a circle P with radius 5 cm and chord $\overline{AB}$ that is 2 cm from P. Find the length of $\overline{AB}$. $2\sqrt{21}$ units

(10)

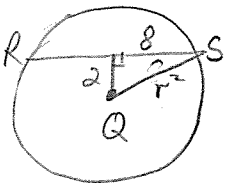


(11)



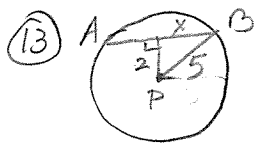
$4^2 + x^2 = 10^2$
$x^2 = 84$
$x = 2\sqrt{21}$

(12)



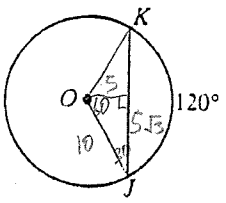
$2^2 + 8^2 = r^2$
$4 + 64 = r^2$
$\sqrt{68} = r$
$2\sqrt{17} = r$

(13)



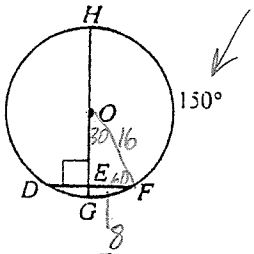
$2^2 + x^2 = 25$
$x^2 = 21$
$x = \sqrt{21}$

17.



If $OJ = 10$, $JK =$ ___. $10\sqrt{3}$

18.



If $OE = 8\sqrt{3}$, $HG =$ ___. 32

21. Use trigonometry to find the measure of the arc cut off by a chord 12 cm long in a circle of radius 10 cm.

$\tan\theta = \frac{6}{8} = \frac{3}{4}$

$\theta \approx 36.8 \approx 37°$

arc $= 74°$

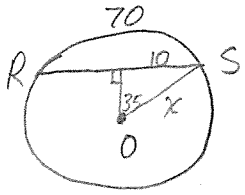
22. In $\odot O$, $m\widehat{RS} = 70$ and $RS = 20$. Use trigonometry to find the radius of $\odot O$.

radius ≈ 17.4 units.

25. A, B, C are points on $\odot O$ such that $\triangle ABC$ is equilateral. If the radius of the circle is 6, what is the perimeter of $\triangle ABC$?

$P = 18\sqrt{3}$

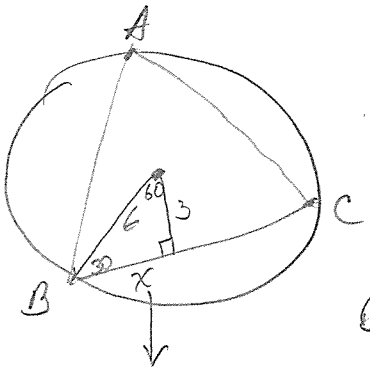
(22)



$\sin 35 = \frac{10}{x}$

$x \approx 17.4344$

(25)



$x = 3\sqrt{3}$

$BC = 6\sqrt{3}$

Perimeter $= 3(6\sqrt{3})$

$= 18\sqrt{3}$