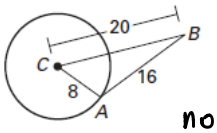
Geometry Chapter 10 Review

Name Key

Block _____ Date _____

1. Is $\overline{AB}$ tangent to $\odot A$? Explain your reasoning

a.



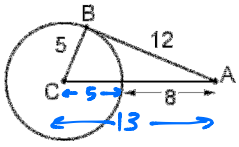
$20^2 \square 8^2+16^2$

$400 \square 64+256$

$400 > 320$

no because $\angle A$ is not a right angle

b.



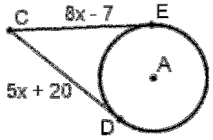
$13^2 \square 5^2+12^2$

$169 \square 25+144$

$169 = 169$

yes because $\angle B$ is a right angle

2. E and D are points of tangency. Solve for x.

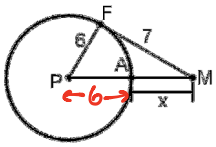


$8x-7=5x+20$

$3x = 27$

$x=9$

3. Given that $\overline{FM}$ is tangent solve for x.



$6^2+7^2=(6+x)^2$

$36+49=(6+x)(6+x)$

$85=36+6x+6x+x^2$

$0=-49+12x+x^2$

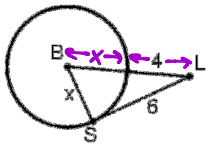
$0=x^2+12x-49$

$x=\frac{-12\pm\sqrt{12^2-4(1)(-49)}}{2(1)}$

$x=\frac{-12\pm\sqrt{144+196}}{2}$

$x=\frac{-12\pm\sqrt{340}}{2}\approx 3.1295, -15.1295$

4. Given that $\overline{LS}$ is tangent solve for x.



$x^2+6^2=(x+4)^2$

$x^2+36=(x+4)(x+4)$

$x^2+36=x^2+4x+4x+16$

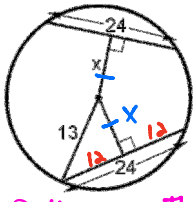
$x^2+36=x^2+8x+16$

$36=8x+16$

$20=8x$

$2.5=x$

5. Solve for x.



since chords are congruent, the chords must be equidistant from the center

since the line from center is $\perp$ to chord, it bisects the chord

Pythagorean Theorem:

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

$x^2+144=169$

$x^2=25$

$x=5$

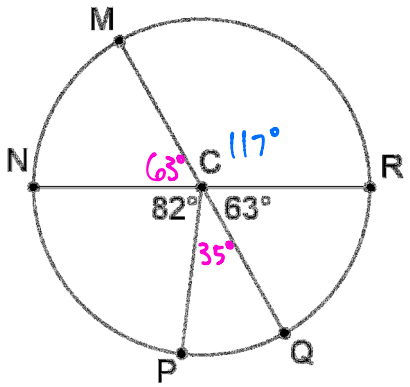
6. Find the indicated measure. $\overline{MQ}$ and $\overline{NR}$ are diameters of $\odot C$ in the image.

a. $m\widehat{MN} =$ 63°

b. $m\widehat{NPR} =$ 180°

c. $m\widehat{PQ} =$ 35°

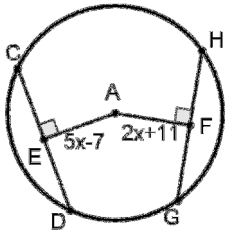
d. $m\widehat{MRP} =$ 215°



$82+63=145$ $\quad 180-145=35$ $\quad 180-63=117$

$117+63+35=215$ or $360-145=215$

7. Solve for x in $\odot A$ given that $\overline{CD} \cong \overline{HG}$



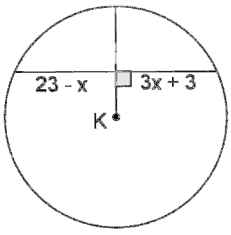
Since $\overline{CD} \cong \overline{HG}$, the chords must be equidistant from the center, so $\overline{AE} \cong \overline{AF}$

$5x-7=2x+11$

$3x = 18$

$x = 6$

8. Solve for x in $\odot K$.



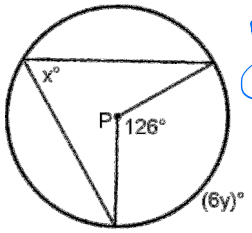
because the radius is $\perp$ to the chord, it bisects the chord

$23-x=3x+3$

$20 = 4x$

$5 = x$

9. Solve for x and y in $\odot P$.



$126=6y$

$21=y$

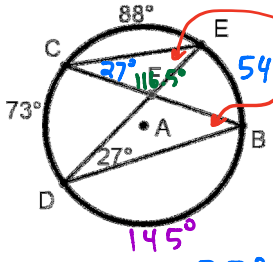
$2\overline{)126}$ $\quad 63$

$x=63$

$88+73+54=215$

$360-215=145$

10. Determine the following values:



36.5

$2\overline{)73}$

$27+36.5=63.5$

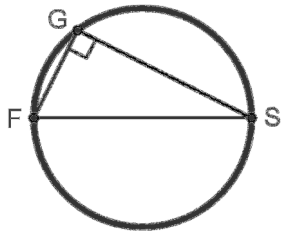
$180-63.5=116.5$

or $\frac{88+145}{2} = \frac{233}{2} = 116.5$

$m\angle ECB =$ 27° $\quad m\angle CED =$ 36.5°

$m\angle CFE =$ 116.5° $\quad m\widehat{BD} =$ 145°

11. Which is the most specific name for $\overline{FS}$?

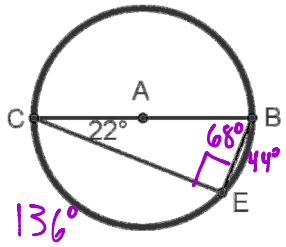


a. Chord
b. Secant
c. Diameter
d. Tangent

Explain your reasoning:

Because $\angle G$ is a right angle F and S must be the endpoints of a semicircle, thus $\overline{FS}$ is a diameter

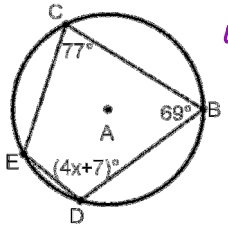
12. Given $\overline{BC}$ is a diameter solve for $m\widehat{CE}$.



$90-22=68°$

$68 \cdot 2 = 136° = m\widehat{CE}$

13. Solve for x in the diagram.



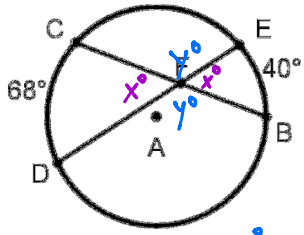
$4x+7+77=180$

$4x+84=180$

$4x=96$

$x=24$

14. Determine the following values:



$\frac{\text{arc}+\text{arc}}{2} = \text{angle}$

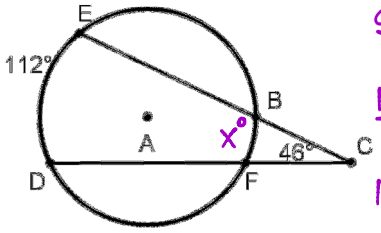
$\frac{68+40}{2} = x$

$\frac{108}{2} = x = 54$

$m\angle CFE =$ 126° $\quad m\angle BFE =$ 54°

$180° - 54° = y° = 126°$

15. Solve for $m\widehat{BF}$.



$\frac{arc-arc}{2} = angle$

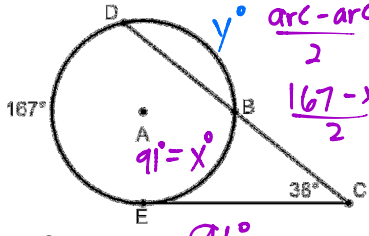
$\frac{112-x}{2} = 46$

$112 - x = 92$

$-x = -20$

$x = 20° = m\widehat{BF}$

16. Determine the following values:



$\frac{arc-arc}{2} = angle$

$167+91=258$

$360-258=102$

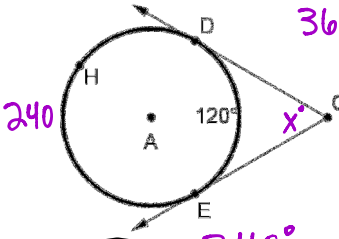
$\frac{167-x}{2} = 38$

$167 - x = 76$

$-x = -91 \rightarrow x = 91$

$m\widehat{BE} =$ 91° $m\widehat{DB} =$ 102°

17. Determine the following values:



$360° - 120° = 240°$

$\frac{arc-arc}{2} = angle$

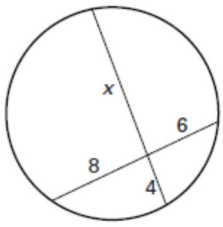
$\frac{240-120}{2} = x$

$\frac{120}{2} = x$

$60 = x$

$m\widehat{DHE} =$ 240° $m\angle DCE =$ 60°

18. Solve for x.

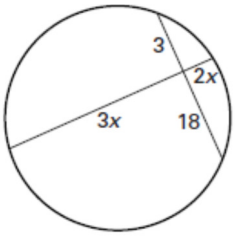


$4 \cdot x = 8 \cdot 6$

$4x = 48$

$x = 12$

19. Solve for x.



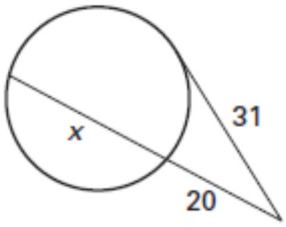
$3 \cdot 18 = 3x \cdot 2x$

$54 = 6x^2$

$9 = x^2$

$3 = x$

20. Solve for x.



Outside (whole) = outside (whole)

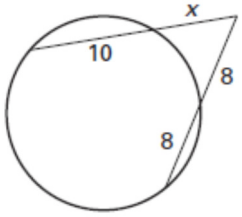
$31\ (31) = 20(20+x)$

$961 = 400 + 20x$

$561 = 20x$

$28.05 = x$

21. Solve for x.



Outside (whole) = outside (whole)

$x(x+10) = 8(8+8)$

$x^2 + 10x = 8(16)$

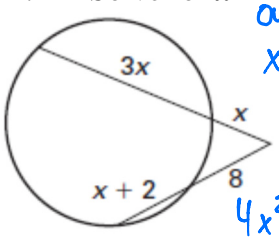
$x^2 + 10x = 128$

$x^2 + 10x - 128 = 0$

$x = \frac{-10 \pm \sqrt{10^2 - 4(1)(-128)}}{2(1)}$

$= \frac{-10 \pm \sqrt{100+512}}{2} = \frac{-10 \pm \sqrt{612}}{2} =$ 7.3693, ~~-17.3693~~

22. Solve for x.



Outside (whole) = outside (whole)

$x(x+3x) = 8(8+x+2)$

$x(4x) = 8(10+x)$

$4x^2 = 80 + 8x$

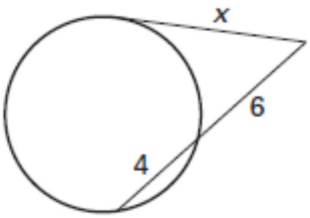
$\frac{4x^2 - 8x - 80 = 0}{4}$

$x^2 - 2x - 20 = 0$

$x = \frac{2 \pm \sqrt{(-2)^2 - 4(1)(-20)}}{2(1)}$

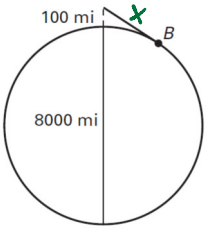
$x = \frac{2 \pm \sqrt{4+80}}{2} = \frac{2 \pm \sqrt{84}}{2} =$ 5.5826, ~~-3.5826~~

23. Solve for x.



$x(x) = 6(6+4)$
$x^2 = 6(10)$
$x^2 = 60$
$x = \sqrt{60} \approx 7.7460$

24. A satellite is orbiting approximately 100 miles above Earth. The furthest site that the satellite is able to take a photo of Earth is located at tangency point B. If Earth's diameter is approximately 8000 miles, what is the distance from the satellite to point B?



$x(x) = 100(100+8000)$
$x^2 = 100(8100)$
$x^2 = 810000$
$x = \sqrt{810,000} = 900$ miles

25. Use proper mathematical notation to name an example of each term from the diagram.

a. Center — F

b. Chord — $\overline{QH}$

c. Diameter — $\overline{BE}$

d. Radius — $\overline{FG}$

e. Point of tangency — Z

f. Common external tangent — $\overline{OZ}$

g. Common internal tangent — $\overline{MJ}$

h. Secant Line — $\overleftrightarrow{DC}$

i. Tangent circles — $\odot A$ (big) and $\odot S$

j. Concentric circles (name center and radii) — $\odot A$ radius $\overline{AM}$, $\odot A$ radius $\overline{AP}$

k. Congruent circles — $\odot A$ (small) and $\odot F$

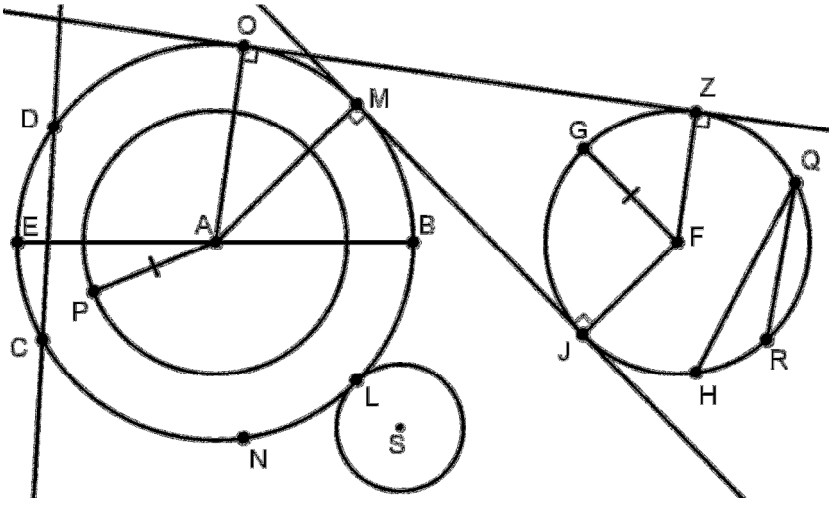
l. Central angle — $\angle GFZ$

m. Minor arc — $\overset{\frown}{GZ}$

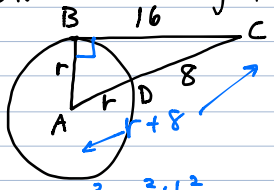
n. Major arc — $\overset{\frown}{ZQJ}$

o. Semicircle — $\overset{\frown}{BNE}$

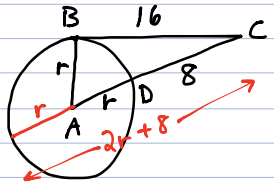
p. Inscribed angle — $\angle HQR$



1) Given $\overline{CB}$ is tangent to $\odot A$.



Center



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

$(r+8)^2 = r^2 + 16^2$

$(r+8)(r+8) = r^2 + 256$

$r^2 + 8r + 8r + 64 = r^2 + 256$

$r^2 + 16r + 64 = r^2 + 256$

$-r^2 \quad -r^2$

$16r + 64 = 256$

$-64 \quad -64$

$\frac{16r}{16} = \frac{192}{16}$

$r = 12$

outside (whole) = outside (whole)

$16(16) = 8(2r+8)$

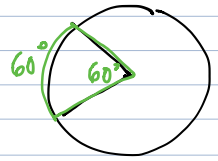
$256 = 16r + 64$

$-64 \quad -64$

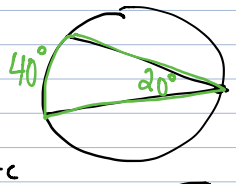
$\frac{192}{16} = \frac{16r}{16}$

$12 = r$

Central angle = arc

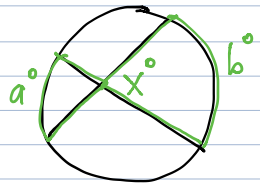


inscribed angle = $\frac{1}{2}$ arc



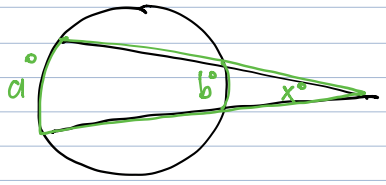
inside angle = $\frac{\text{arc} + \text{arc}}{2}$

$x^\circ = \frac{a^\circ + b^\circ}{2}$

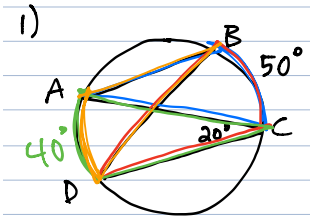


Outside angle = $\frac{\text{big arc} - \text{small arc}}{2}$

$x^\circ = \frac{a^\circ - b^\circ}{2}$



1)



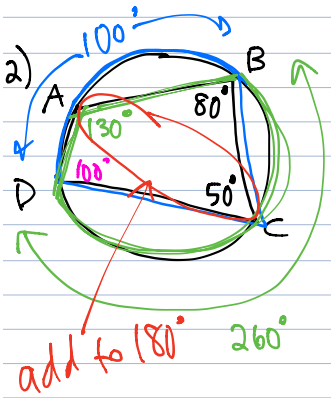
a) $m\angle CAB =$ 25° ← $\frac{1}{2}$ 50°

b) $m\angle CDB =$ 25°

c) $m\overset{\frown}{AD} =$ 40° ← 2 · 20°

d) $m\angle ABD =$ 20°

2)



a) $m\angle DAB =$ 130°

b) $m\overset{\frown}{DAB} =$ 100°