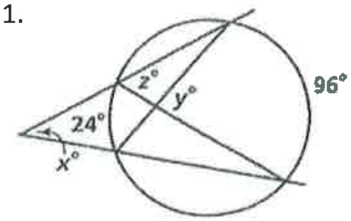
Geometry H Name : Key

Unit 7 Extra Review Packet Date : ______ Period : ____

Please solve for the indicated variable(s).

1.



$x = \frac{1}{2}(96-24)$

$x = \frac{1}{2}(72)$

$\boxed{x = 36}$

$y = \frac{1}{2}(24+96)$

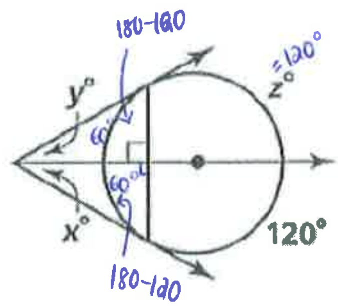
$y = \frac{1}{2}(120)$

$\boxed{y = 60}$

$z = \frac{1}{2}(96)$

$\boxed{z = 48}$

2.



$90 = \frac{1}{2}(60+z)$

$180 = 60+z$

$\boxed{z = 120}$

$x = \frac{1}{2}(120-60)$

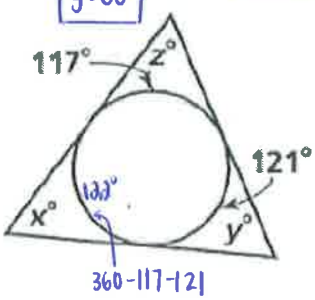
$x = \frac{1}{2}(60)$

$\boxed{x = 30}$

$y = \frac{1}{2}(120-60)$

$y = \frac{1}{2}(60) \Rightarrow \boxed{y = 30}$

3.



$x = \frac{1}{2}(117+121-122)$

$x = \frac{1}{2}(116)$

$\boxed{x = 58}$

$y = \frac{1}{2}(122+117-121)$

$y = \frac{1}{2}(118)$

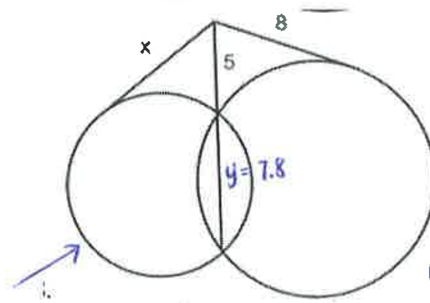
$\boxed{y = 59}$

$z = \frac{1}{2}(122+121-117)$

$z = \frac{1}{2}(126)$

$\boxed{z = 63}$

4.



This side first

$(8)(8) = 5(5+y)$

$64 = 25+5y$

$39 = 5y$

$\boxed{y = 7.8}$

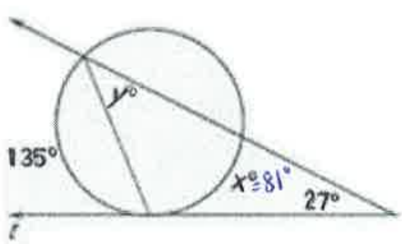
$(x)(x) = 5(5+7.8)$

$x^2 = 5(12.8)$

$x^2 = 64$

$\boxed{x = 8}$

5.



$27 = \frac{1}{2}(135-x)$

$54 = 135-x$

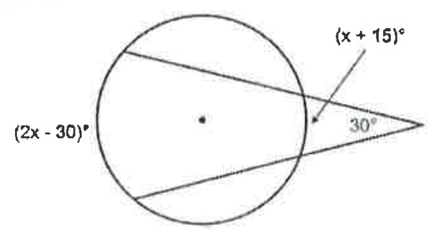
$-81 = -x$

$\boxed{x = 81}$

$y = \frac{1}{2}(81)$

$\boxed{y = 40.5}$

6.



$30 = \frac{1}{2}(2x-30-(x+15))$

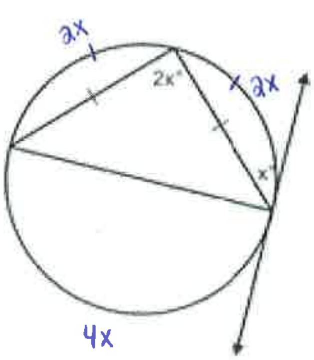
$30 = \frac{1}{2}(2x-30-x-15)$

$30 = \frac{1}{2}(x-45)$

$60 = x-45$

$\boxed{x = 105}$

7.

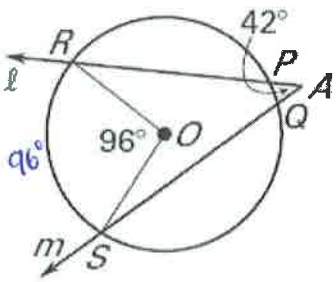


$4x+2x+2x = 360$

$8x = 360$

$\boxed{x = 45}$

8. The secants *l* and *m* intersect at point A and $\overset{\frown}{PQ}$ and $\overset{\frown}{RS}$ are the intercepted arcs. If $m\angle PAQ = 42°$ and $m\angle ROS = 96°$, find $m\overset{\frown}{PQ}$.



$42 = \frac{1}{2}(96 - m\overset{\frown}{PQ})$

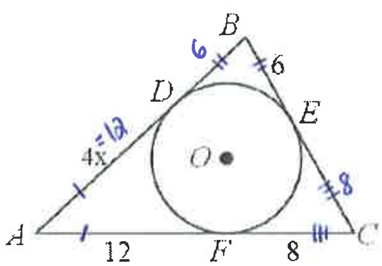
$84 = 96 - m\overset{\frown}{PQ}$

$-12 = -m\overset{\frown}{PQ}$

$\boxed{m\overset{\frown}{PQ} = 12°}$

In #9 – 10, please solve for the indicated variable(s) and find the perimeter of the triangle or quadrilateral.

9.



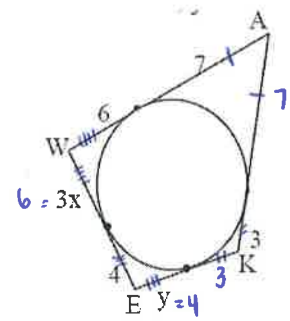
$4x = 12$

$\boxed{x = 3}$

$p = 12 + 6 + 6 + 8 + 8 + 12$

$\boxed{P = 52 \text{ units}}$

10.



$\boxed{y = 4}$

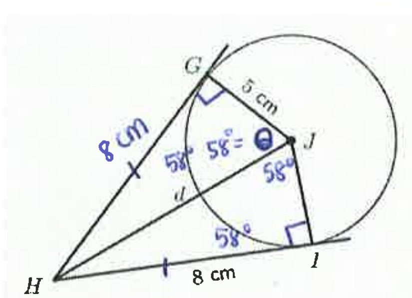
$3x = 6$

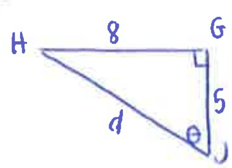
$\boxed{x = 2}$

$P = 6 + 6 + 7 + 7 + 3 + 3 + 4 + 4$

$\boxed{P = 40 \text{ units}}$

11. Given that $\overline{GH}$ and $\overline{IH}$ are tangents to $\odot J$, please find the value of *d* and find $m\overset{\frown}{GI}$.





$\tan\theta = \frac{8}{5}$

$\theta = \tan^{-1}\left(\frac{8}{5}\right)$

$\theta = 58°$

$8^2 + 5^2 = d^2$

$64 + 25 = d^2$

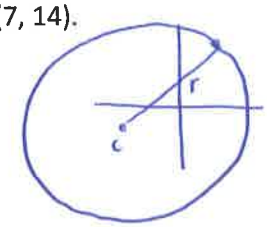
$89 = d^2$

$\boxed{d = \sqrt{89}}$

$m\overset{\frown}{GI} = 58 + 58$

$\boxed{m\overset{\frown}{GI} = 116°}$

12. Write the standard equation of the circle with center (-5, -2) and a point on the circle is (7, 14).



radius $= \sqrt{(-5-7)^2+(-2-14)^2} = \sqrt{(-12)^2+(-16)^2} = \sqrt{144+256} = \sqrt{400} = 20$

$(x--5)^2+(y--2)^2=20^2$

$\boxed{(x+5)^2+(y+2)^2=400}$

13. Write the standard equation of the circle and find the center and the radius given the general equation $x^2+y^2-4x-18y=-81$.

$\frac{1}{2}(-4)=-2^2=4$

$\frac{1}{2}(-18)=-9^2=81$

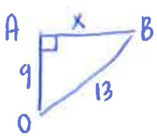
$x^2-4x+4+y^2-18y+81=-81+4+81$

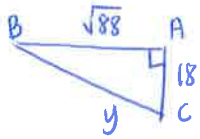
$(x-2)(x-2)+(y-9)(y-9)=4$

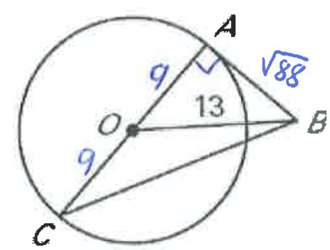
$\boxed{(x-2)^2+(y-9)^2=4}$

center : (2,9)
radius $= \sqrt{4} = 2$

14. In the figure below, $OB = 13$ and $\overline{AB}$ is tangent to $\odot O$, whose diameter $\overline{AC}$ has length 18. Find *BC*.







$x^2+9^2=13^2$

$x^2+81=169$

$x^2=88$

$x=\sqrt{88}$

$(\sqrt{88})^2+18^2=y^2$

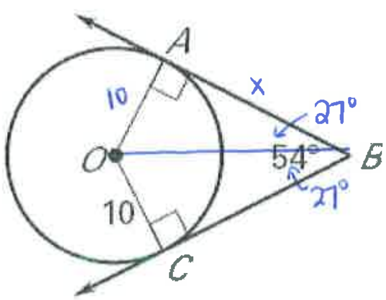
$88+324=y^2$

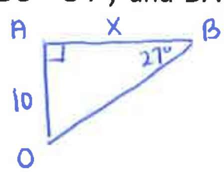
$412=y^2$

$y=\sqrt{412} \approx 20.3$

$\boxed{BC \approx 20.3 \text{ units}}$

15. In the figure below, $OC=10$, $m\angle ABC=54°$, and $\overrightarrow{BA}$ and $\overrightarrow{BC}$ are tangents to $\odot O$. Find *BC*.





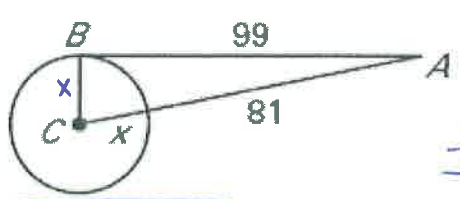
$\frac{\tan 27°}{1} = \frac{10}{x}$

$\frac{10}{\tan 27} = \frac{x \cancel{\tan 27°}}{\cancel{\tan 27}}$

$x \approx 19.6$

$\boxed{BC \approx 19.6 \text{ units}}$

16. Find the length of the radius of $\odot C$.



$x^2+99^2=(x+81)^2$

$x^2+9801=(x+81)(x+81)$

$\cancel{x^2}+9801=\cancel{x^2}+162x+6561$

$-x^2 \qquad -x^2$

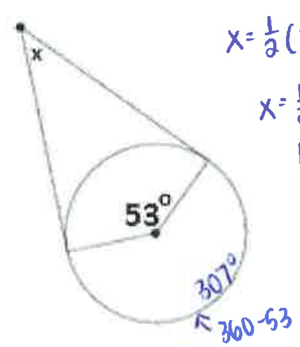
$9801=162x+6561$

$3240=162x$

$x=20$

$\boxed{\text{So the radius} = 20 \text{ units}}$

17. Please solve for x.



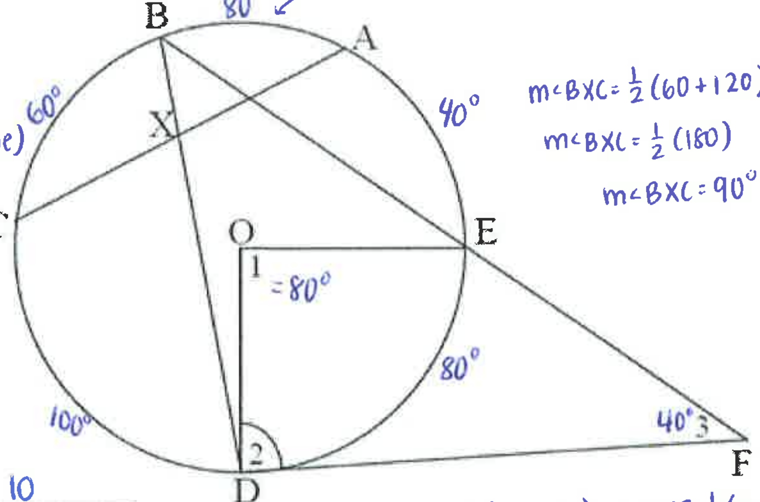
$x=\frac{1}{2}(307-53)$

$x=\frac{1}{2}(254)$

$\boxed{x=127}$

18. Given $\odot O$, radii $\overline{OD}$ and $\overline{OE}$, tangent $\overline{DF}$, secant $\overleftrightarrow{BF}$, $m\widehat{BC} = 60°$, $m\widehat{DC} = 100°$, $m\widehat{DE} = 80°$, and $m\widehat{EA} = 40°$, find:

360-40-80-100-60



a. $m\widehat{AB} =$ 80°

b. $m\angle 1 =$ 80° (same as arc ED since it is a central angle)

c. $m\angle 2 =$ 90° ($\overline{FD}$ is tangent to the circle)

d. $m\angle BXC =$ 90° (angle w/ vertex INSIDE)

e. $m\angle 3 =$ 40°

f. $m\angle BDF =$ 100° (angle w/ vertex ON)

g. If $BE = 21$ and $EF = 4$, then $DF =$ 10

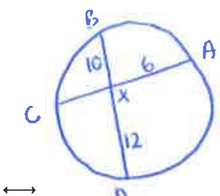
h. If $BD = 22$, $BX = 10$, and $AX = 6$, then $CX =$ 20

$m\angle BXC = \frac{1}{2}(60+120)$
$m\angle BXC = \frac{1}{2}(180)$
$m\angle BXC = 90°$

$m\angle 3 = \frac{1}{2}(160-80)$
$m\angle 3 = \frac{1}{2}(80)$
$m\angle 3 = 40°$

$m\angle BDF = \frac{1}{2}(80+40+80)$
$m\angle BDF = \frac{1}{2}(200)$
$m\angle BDF = 100°$

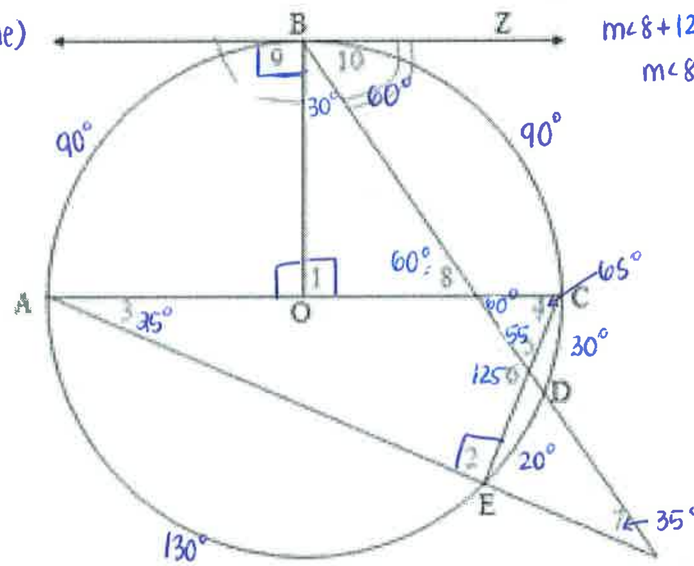
$(DF)(DF) = 4(4+21)$
$DF^2 = 4(25)$
$DF^2 = 100$
$DF = 10$



$(10)(12) = (6)(CX)$
$120 = 6CX$
$CX = 20$

19. Given $\overleftrightarrow{BZ}$ is tangent to $\odot O$, $\overline{AC}$ is a diameter, $m\widehat{BC} = 90°$, $m\widehat{CD} = 30°$, and $m\widehat{DE} = 20°$, find all marked angles.

$m\angle 1 + m\angle 8 + 30 = 180$ (Δ sum)
$90 + m\angle 8 + 30 = 180$
$m\angle 8 + 120 = 180$
$m\angle 8 = 60°$



a. $m\angle 1 =$ 90° (central angle to $\widehat{BC}$)

b. $m\angle 2 =$ 90° (inscribed to a semicircle)

c. $m\angle 3 =$ 25°

d. $m\angle 4 =$ 65° (inscribed to $\widehat{AE}$)

e. $m\angle 5 =$ 55°

f. $m\angle 6 =$ 125°

g. $m\angle 7 =$ 35°

h. $m\angle 8 =$ 60°

i. $m\angle 9 =$ 90°

j. $m\angle 10 =$ 60°

$m\angle 7 = \frac{1}{2}(90-20)$
$m\angle 7 = \frac{1}{2}(70)$
$m\angle 7 = 35°$

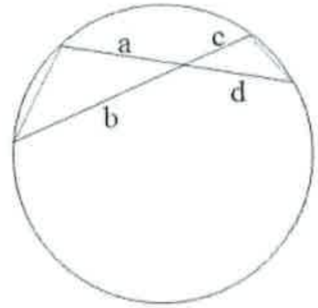
$m\angle 2 + m\angle 3 + m\angle 4 = 180$ (Δ sum)
$90 + m\angle 3 + 65 = 180$
$m\angle 3 + 155 = 180$
$m\angle 3 = 25°$

Δ sum
$m\angle 5 + 60 + 65 = 180$
$m\angle 5 + 125 = 180$
$m\angle 5 = 55°$

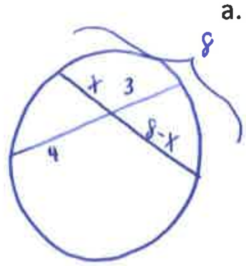
$m\angle 5 + m\angle 6 = 180$ (linear pair)
$55 + m\angle 6 = 180$
$m\angle 6 = 125°$

$m\angle 10 = \frac{1}{2}(90+30)$
$m\angle 10 = \frac{1}{2}(120)$
$m\angle 10 = 60°$

20. Please use the diagram below to solve for the indicated variables.



a. If $a+d=8$, $b=4$, and $c=3$, find a.



$(x)(8-x)=(3)(4)$

$8x-x^2=12$

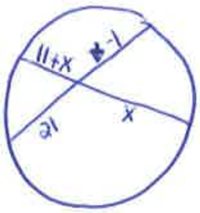
$0=x^2-8x+12$

$0=(x-6)(x-2)$

$x=6,\ x=2$

$\boxed{a=6 \text{ or } a=2}$

b. If $b=21$, a is 11 more than d, and c is 1 less than d, then solve for a, b, c, and d.



$21(x-1)=x(11+x)$

$21x-21=11x+x^2$

$0=x^2-10x+21$

$0=(x-7)(x-3)$

$x=7$ or $x=3$

$a=11+x=11+7$ or $11+3$

$a=18$ or 14

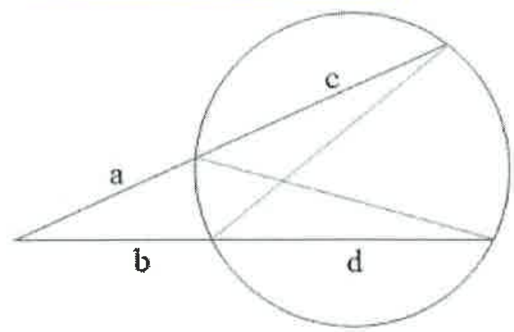
$b=21$

$c=x-1=11-1$ or $3-1$

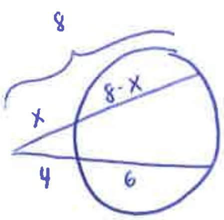
$c=10$ or 2

$d=x=7$ or 3

21. Please use the diagram below to solve for the indicated variables.



a. If $a+c=8$, $b=4$, and $d=6$, find a.



$x(x+8-x)=4(4+6)$

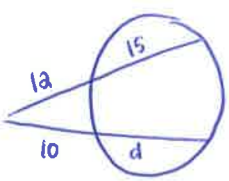
$x(8)=4(10)$

$8x=40$

$x=5$

$\boxed{a=5}$

b. If a = 12, b = 10, and c = 15, find d.



$12(12+15)=10(10+d)$

$12(27)=100+10d$

$324=100+10d$

$224=10d$

$\boxed{d=22.4}$

22. Write the equation of a circle with a center at $(\overset{h}{5},\overset{k}{-7})$ and a radius of $2\sqrt{5}$.

$(x-5)^2+(y--7)^2=(2\sqrt{5})^2$

$(x-5)^2+(y+7)^2=2^2\sqrt{5}^2$

$(x-5)^2+(y+7)^2=4(5)$

$\boxed{(x-5)^2+(y+7)^2=20}$