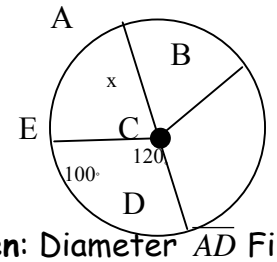
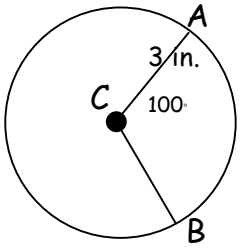
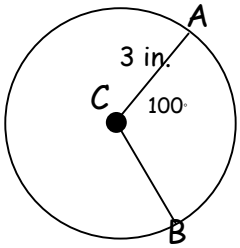
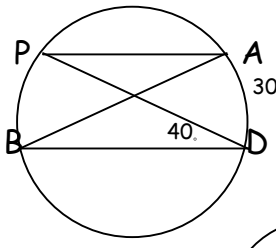
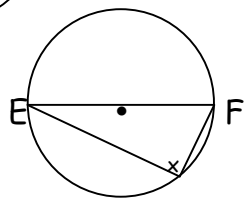
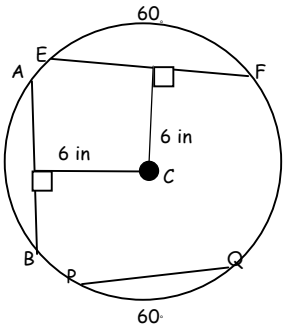
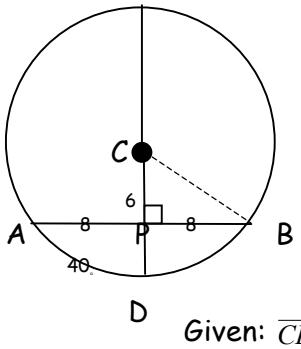
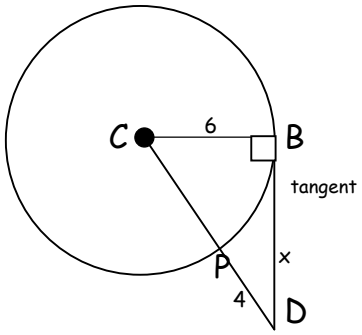
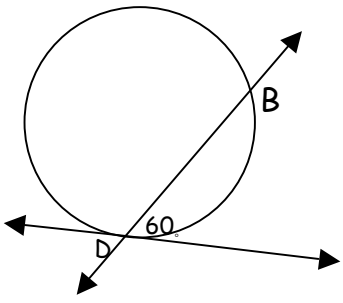
Name _____ **Block** _____

Geometry Journal: ___Circles_____

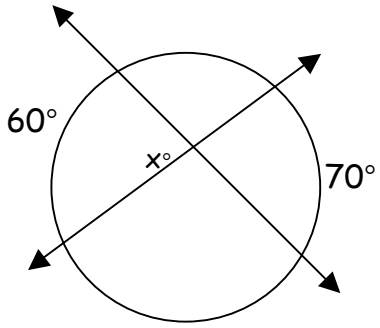
Post, Thm, or Defn	Example/Drawing	Conclusion
1.**Central Angle** = measure of intercepted arc. **Vertex at center of circle**	 **Given**: Diameter $\overline{AD}$ Find x.	$m\angle ACB = X = 60°$ $m\overset{\frown}{BD} = 120°$ } **minor** arcs < 180 $m\overset{\frown}{AB} = 60°$ } $m\overset{\frown}{AD} = 180°$ semicircle exactly 180° $m\,BDE = 220°$ **major** arc >180° { Name with 3 points}
2.**Arc Length** : part of the circumference of a circle Arc length = $\frac{arc°}{360} \bullet \frac{2\pi r}{1}$		Arc Length = $\frac{100}{360} \bullet \frac{2\pi(3)}{1}$ $= \frac{5}{18} \bullet \frac{6\pi}{1}$ $= \frac{5\pi}{3}$ **if exact use π; if not use 3.14** **REDUCE FRACTIONS**
3. **Area of Sector**: part of the area of a circle Area $_{sector}$ = $\frac{arc°}{360} \bullet \frac{\pi r^2}{1}$		Area $_{sector}$ = $\frac{100°}{360} \bullet \frac{\pi 3^2}{1}$ $= \frac{5°}{18} \bullet \frac{9\pi}{1}$ $= \frac{5\pi}{2}$ inches^2
4.Inscribed Angle: = $\frac{1}{2}$ its intercepted arc (Vertex is on the circle)	  **EF is diameter**	$m\angle ABD = \frac{1}{2}(30) = 15°$ $m\angle APD = 15°$ they intercept the same arc so they are =. $m\overset{\frown}{PB} = 80°$ $m\angle PAB = 40°$ Diameter intercepts 180° so $x = \frac{1}{2}(180) = 90°$

5. **If 2 Chords are equidistant from the center, then they are congruent.**		$\overline{AB} \cong \overline{EF}$ same distance from C $\overline{EF} \cong \overline{PQ}$ their arcs are both 60°
6. **If a diameter (or radius) is ⊥ to a chord, then the chord and its arc are bisected.**	 Given: $\overline{CD} \perp \overline{AB}$ find radius.	$\overset{\frown}{mDB}$ = 40° PB =8 Find radius: draw CB $c^2 = a^2 + b^2$ $= 8^2 + 6^2$ $= 64 + 36$ $c^2 = 100$ c =10 = AB = CD
7. **If a line is tangent to a circle then it is ⊥ to the radius at the point of tangency.**		m∠CBD = 90° CP = 6 (another radius) x = tangent segment $10^2 = x^2 + 6^2$ $100 - 36 = x^2$ 8 = x
8. **If a secant and a tangent meet at a point of tangency –** **angle formed = $\frac{1}{2}$(intercepted arc)** (vertex on circle)		$\overset{\frown}{mBD}$ = 120°

9. **If Two Secants Meet**

Inside a Circle

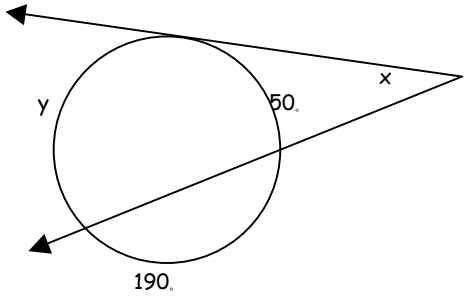
angle = ½ (sum of intercepted arcs)



x = ½ (60 + 70)
= ½ (130)
= 65°

10. **If Tangent and Secant Meet Outside a Circle**

angle formed = ½ (difference of arcs)

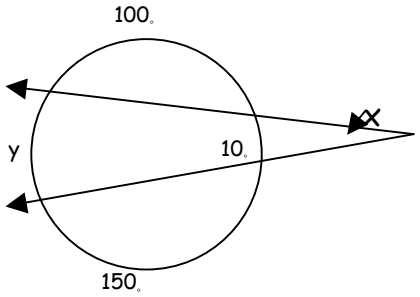


y = 360 - (50+190)
= 360 - 240
y = 120°

x = ½ (120 - 50)
= ½ (70) = 35°

11. **If 2 secants meet outside circle -**

angle formed = ½ (difference of arcs)

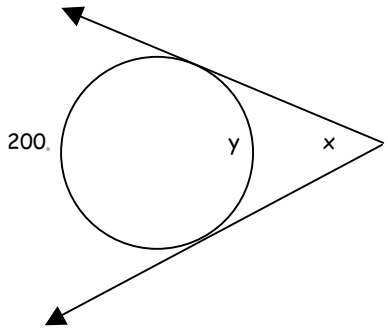


y = 360 - (100+10+150)
= 360 - 260
= 100

x = ½(100 - 10)
= ½ (90)
= 45°

12. **If Two Tangents Meet Outside A Circle**

angle formed = ½ (difference of arcs)

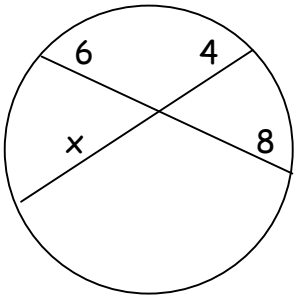


y = 360 - 200 = 160°

x = ½ (200-160)
= ½ (40) = 20°

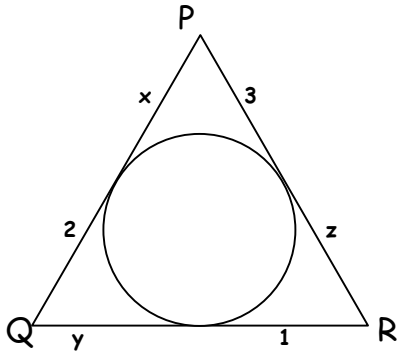
13. **If 2 Chords Intersect <u>Inside</u> Circle**

Product of segments are equal.



$4x = 6(8)$
$4x = 48$
$x = 12$

14. **If <u>2 Tangent</u> segments from the same <u>Exterior</u> point are <u>tangent</u> to a circle, then they are <u>congruent.</u>**



Find perimeter of ΔPQR.

$x = 3$

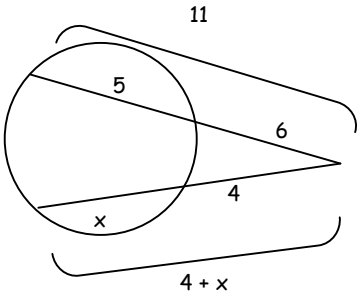
$y = 2$

$z = 1$

perimeter = 12

15. **If <u>2 Secant</u> segments are drawn to the <u>same exterior point -</u>**

(whole seg.)(outside part) = (whole seg.)(outside part)



$11(6) = (x + 4)(4)$

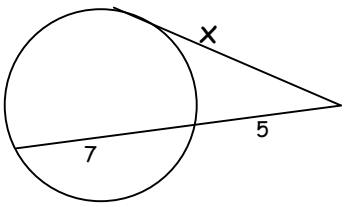
$66 = 4x + 16$

$50 = 4x$

$12.5 = x$

16. **If a <u>Tangent and a Secant</u> are drawn to the <u>same exterior</u> point.**

$(\text{tangent})^2$ = (whole seg.)(outside part)

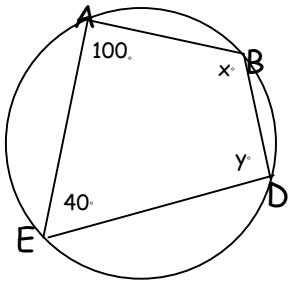


$x^2 = 5(12)$

$x = \sqrt{60}$

$= 2\sqrt{15}$ approximately 7.7

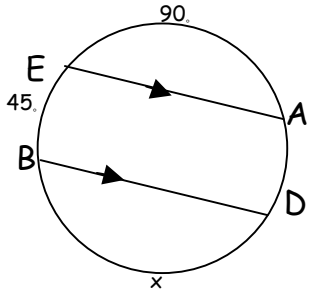
17. **If a <u>Quad. is inscribed</u> in a circle, then its <u>opposite angles are supplementary.</u>**



x = 140°

y = 80°

18. **Parallel chords cut Congruent arcs Between them.**



$\overset{\frown}{BE} \cong \overset{\frown}{AD}$

$m\overset{\frown}{AD} = 45°$

x = 180°

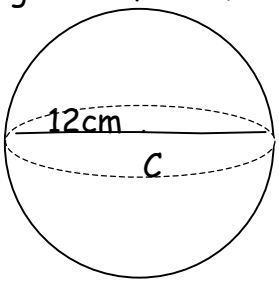
so what is $\overline{BD}$? (diameter)

19.

SA of Sphere

$SA = 4\pi r^2$

Find amount of leather covering the soft ball.



r = 6

$SA = 4\pi(6^2)$

$= 4\pi(36)$

$SA = 144\ \pi\ cm^2$ (exact)

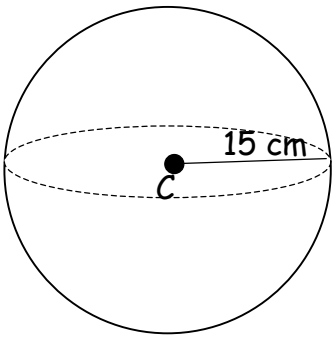
$\approx 144(3.14) =$

$452.16\ cm^2$

20.

V of Sphere

$V = \frac{4}{3}\pi r^3$



$V = \frac{4\pi r^3}{3}$

$= \frac{4\pi(15)^3}{3}$

$= 4500\ \pi cm^3$ exact

$4500(3.14) \approx 14130\ cm^3$

FOR TEACHERS ONLY:

WS 8-1	# 1-4
WS 8-2	# 5-8 AND 14
WS 8-3	# 9-12
WS 8-4	# 13-16
WS 8-5	# 17-18
WS 8-6	REVIEW
WS 8-7	TEST