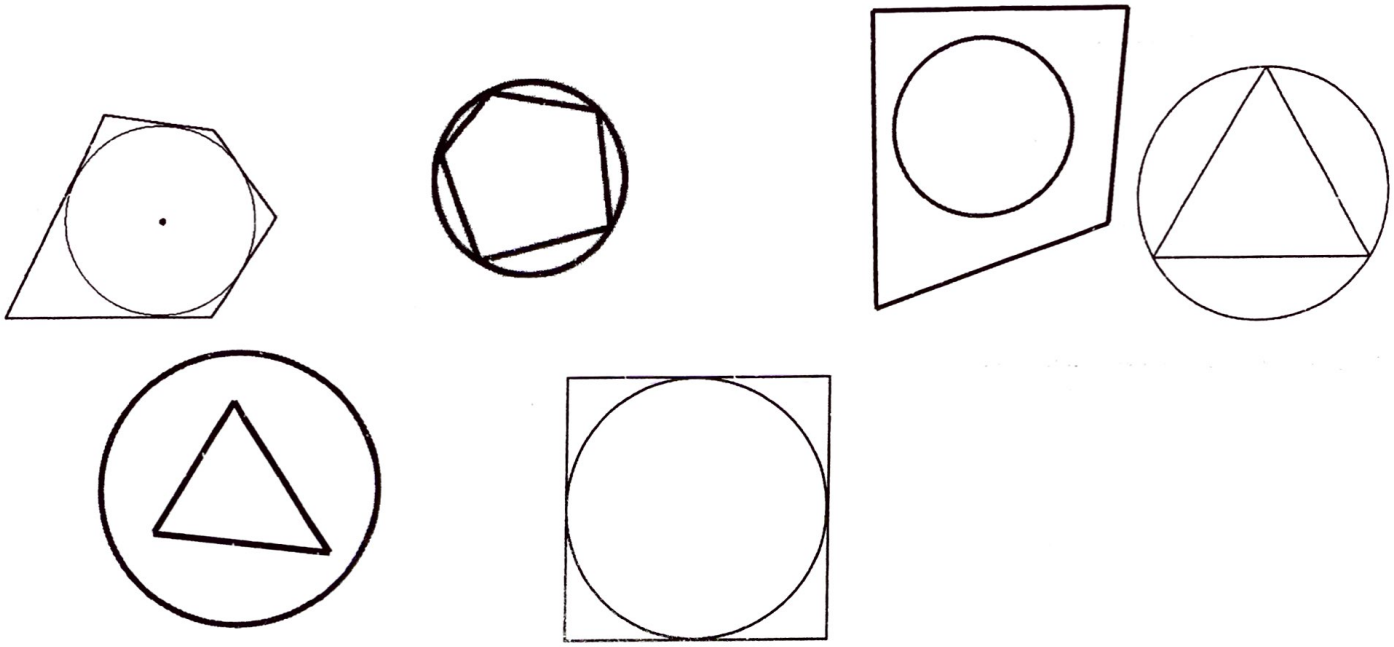
## Honors Math 3: Modeling with Trigonometric Functions

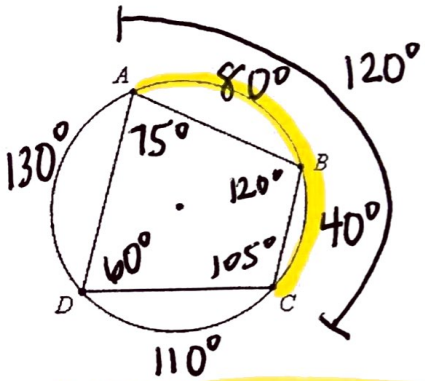
### Inscribed & Circumscribed Guided Notes (Circles, Quadrilaterals, Triangles)



*What do you see?*

**Therefore, a polygon is _____ ___ a circle if all of the vertices lie on the circle.**

**A polygon is _____ _____ a circle if each side is tangent to the circle.**




Given: $m\angle ADC = 60^\circ$, $m\overset{\frown}{BC} = 40^\circ$ and $m\overset{\frown}{CD} = 110^\circ$, find:

$m\angle DAB =$ 75° 150/2

$m\angle BCD =$ 105° 210/2

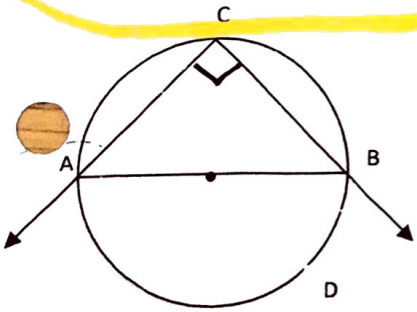
$m\angle ABC =$ 120° 240/2

B, D | A, C

*What do you notice about opposite angles in the quadrilateral?* supplementary

*About the sum of all angles?* 360°

**Therefore,** opposite ∠s of an inscribed quadrilateral are supplementary




What is $\overline{AB}$? diameter

What is $\overset{\frown}{ACB}$? semi ☺

What is $m\overset{\frown}{ADB}$? 180°

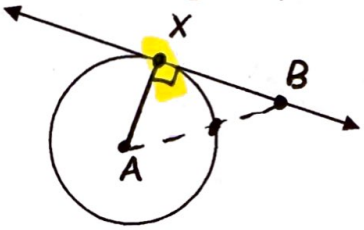
What is $m\angle ACB$? 90°

*What do you notice?* Inscribed ∠ that intercepts semicircle is a right angle!

# Properties of Tangents

**Tangent to a circle-** lies in the plane of the circle and intersects the circle in exactly one point.

**Theorem**- If a line is tangent to a circle, then the line is perpendicular to the radius at the point of tangency.

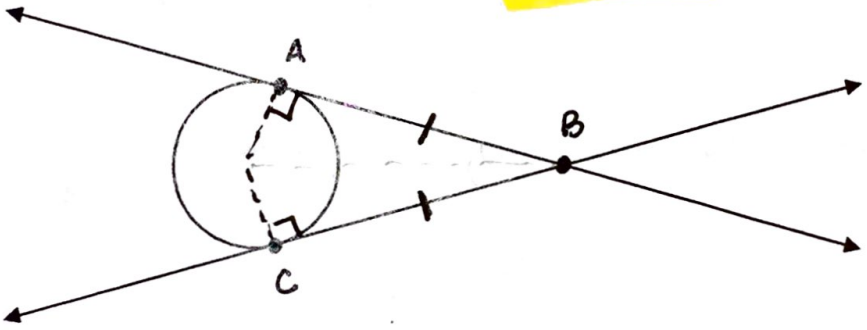



$\overline{AX} \perp \overleftrightarrow{XB}$

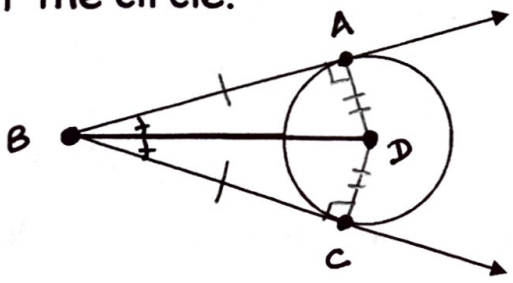
B

**Corollary**- Two tangent segments from a common external point are congruent.

$\overline{AB} \cong \overline{CB}$




**Corollary-** The two tangent rays from a common external point determine an angle that is bisected by the ray from the external point to the center of the circle.




$\measuredangle ABD \cong \measuredangle CBD$

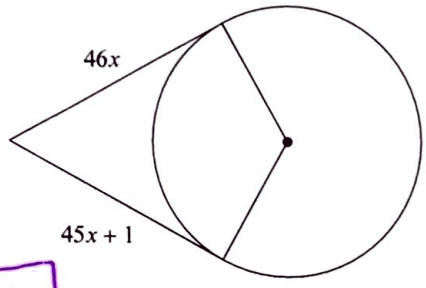
Honors Math 3 Name McG Key

# Day 2 Tangents in Circles, etc.

*PARTY HAT PROBS!

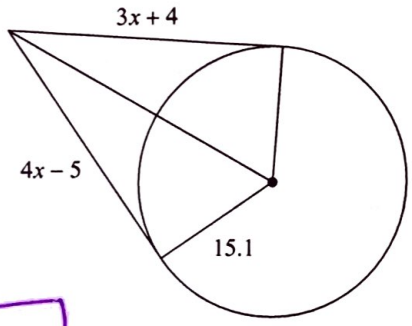
**Solve for *x*. Assume that lines which appear to be tangent are tangent.**

1)



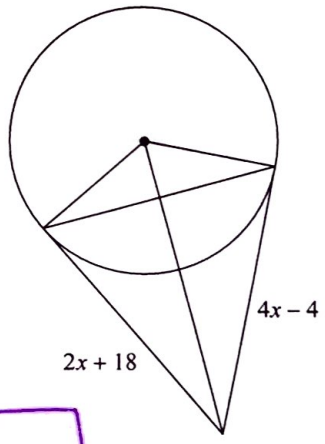

x = 1

2)



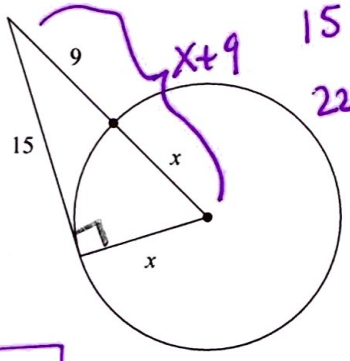

x = 9

3)




x = 11

4)




$15^2 + x^2 = (x+9)^2$

$225 + x^2 = x^2 + 18x + 81$

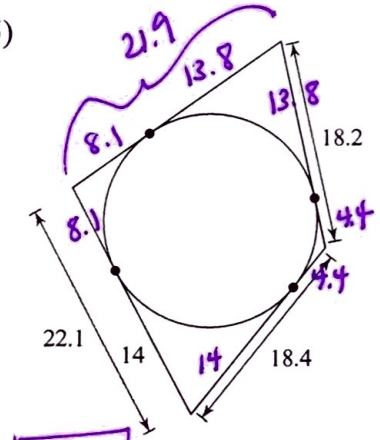
$144 = 18x$

$x = 8$

x = 8

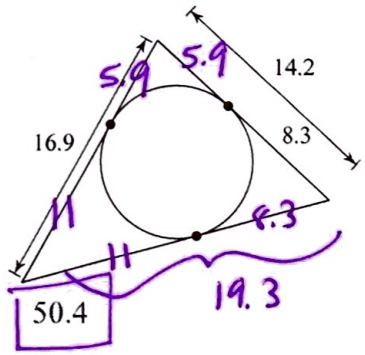
**Find the perimeter of each polygon. Assume that lines which appear to be tangent are tangent.**

5)



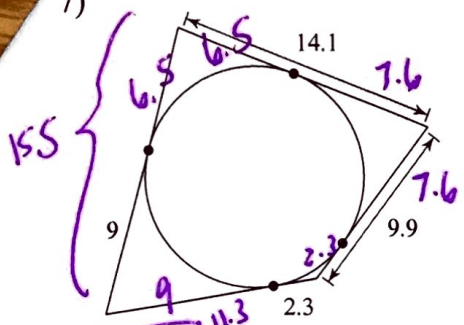

80.6

6)



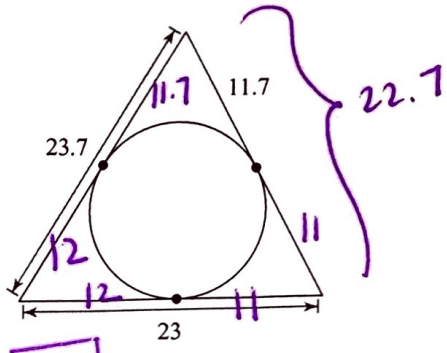

50.4

7)




50.8

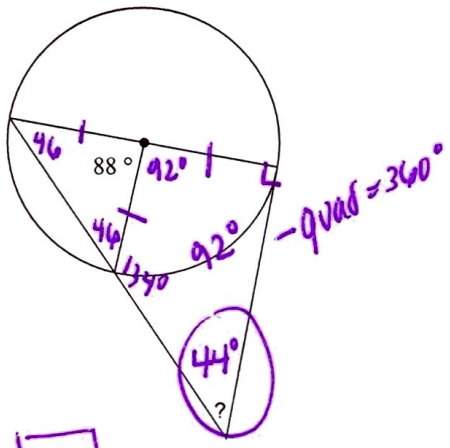
8)




69.4

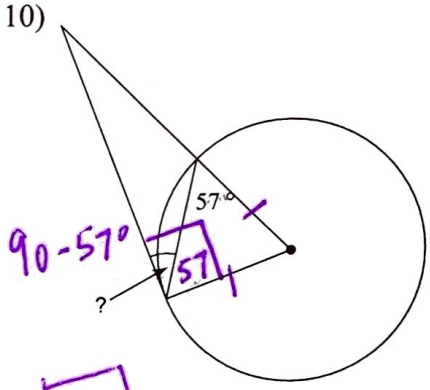
**Find the angle measure indicated. Assume that lines which appear to be tangent are tangent.**

9)



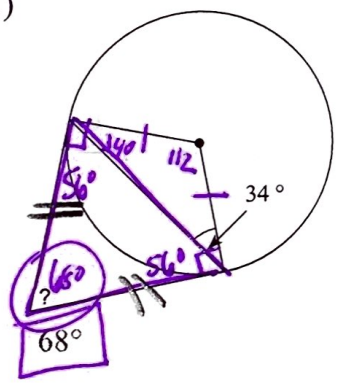

44°

10)



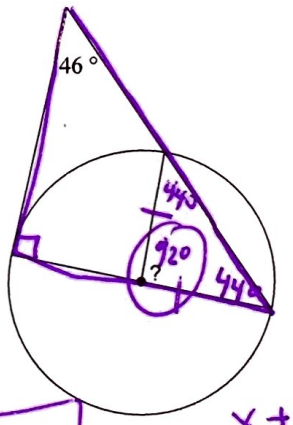

33°

11)




68°

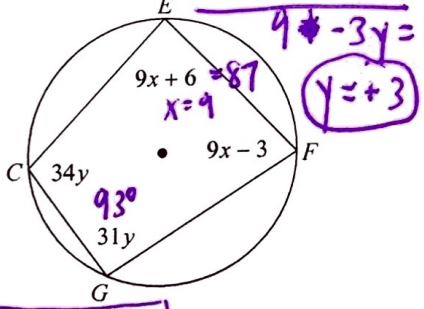
12)




92°

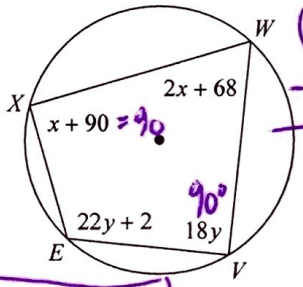
**Solve for $x$ and $y$.**

13)




$x = 9,\ y = 3$

14)




$x = 0,\ y = 5$

$9x+6+31y=180$

$(-)\ 9x-3+34y=180$

$9+-3y=0$

$y=+3$

$x+90+18y=180$

$2x+68+22y+2=180$

$2x+22y=110$

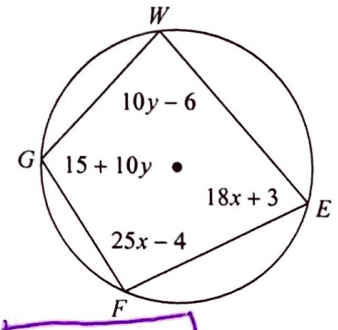
$(x+18y=90)\cdot -2$

$-2x-36y=-180$

$-14y=-70$

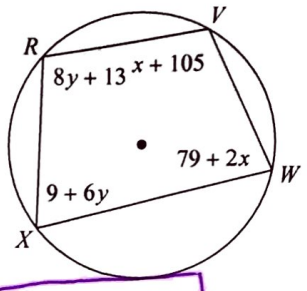
$y=5$

15)




$x = 4,\ y = 9$

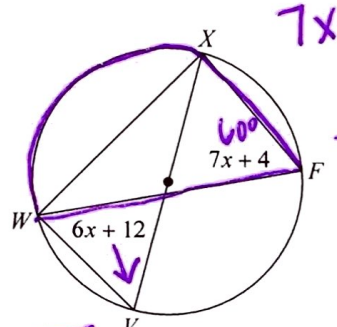
16)




$x = 0,\ y = 11$

**Find the measure of the arc or angle indicated.**

17) Find $m\overset{\frown}{WX}$




$7x+4=6x+12$

$x=8$

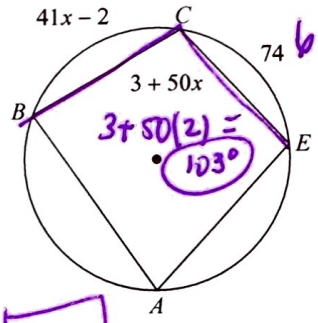
$7(8)+4=60°$

$\times 2$

$120°$

120°

18) Find $m\angle ECB$




$2(3+50x)+41x-2+74=360$

$6+100x+41x+72=360$

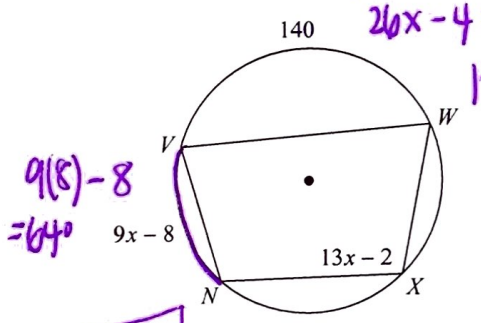
$141x+78=360$

$141x=282$

$x=2$

103°

19) Find $m\overset{\frown}{NV}$




$2(13x-2)=9x-8+140$

$26x-4=9x+132$

$17x=136$

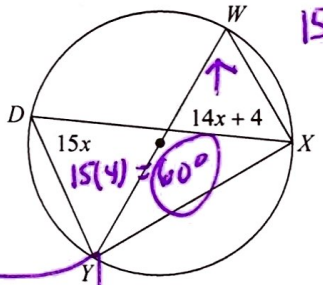
$x=8$

$9(8)-8$

$=64°$

64°

20) Find $m\angle XDY$



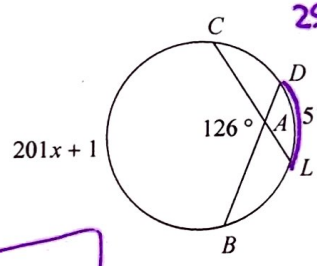

$15x=14x+4$

$x=4$

60°

**Find the measure of the arc or angle indicated. Assume that lines which appear tangent are tangent.**

21) Find $m\overset{\frown}{DL}$




$126=\frac{1}{2}(51x-1+201x+1)$

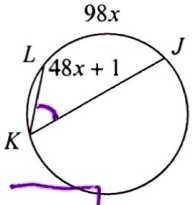
$252=252x$

$x=1$

$51(1)-1=50°$

50°

22) Find $m\angle JKL$




$2(48x+1)=98x$

$96x+2=98x$

$2=2x$

$x=1$

$48(1)+1=49°$

49°