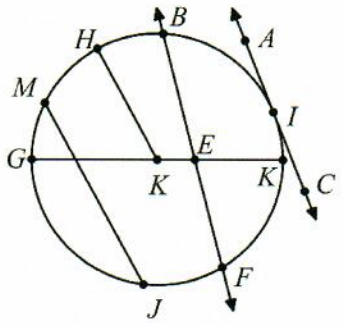
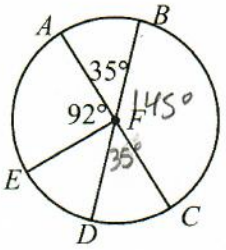
SM2H - Unit 6 Circle Review Name Key

**Identify a line or segment in Circle *K* that is described by each term:**




1. Chord $\overline{MJ}$
2. Secant $\overleftrightarrow{BF}$
3. diameter $\overline{GK}$
4. tangent $\overleftrightarrow{AC}$
5. radius $\overline{KH}$

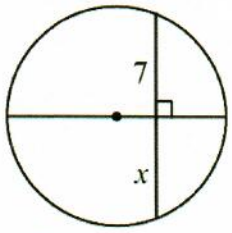
$\overline{AC}$ and $\overline{BD}$ **are diameters. Find the indicated measure**




6. $m\overset{\frown}{DC}$ $35°$
7. $m\overset{\frown}{BEC}$ $360-145=215°$
8. $m\overset{\frown}{BC}$ $180°-35°=145°$
9. $m\overset{\frown}{ED}$ $180-92-35=53°$

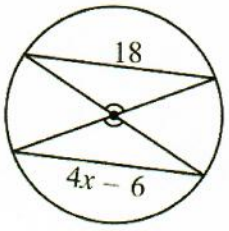
**Find the value of the variable(s). Give a REASON.**

10.



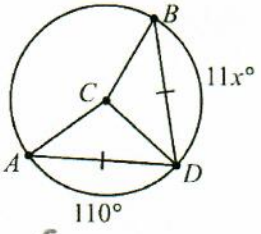

$x=7$, diameter $\perp$ chord, diameter bisects chord

11.



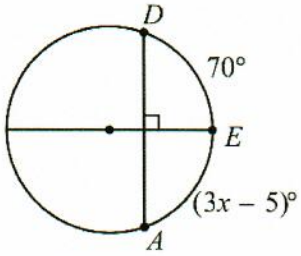

$4x-6=18$
$4x=24$
$x=6$
If arc $\cong$ arc, then chord $\cong$ chord.

12.



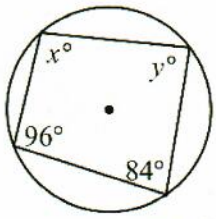

$11x=110$
$x=10$
If chord $\cong$ chord, then arc $\cong$ arc

13.



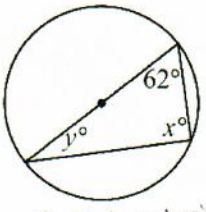

$3x-5=70$
$3x=75$
$x=25$
diameter $\perp$ chord, diameter bisects arc.

14.



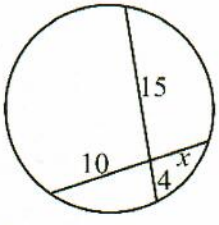

$x=180°-84°=96°$
$y=180°-96°=84°$
opposite angles are supplementary

15.



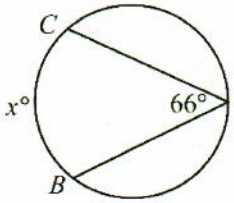

$x=90°$ right triangle, diameter = hypotenuse
$y=180-90-62=28°$
all angles in a $\triangle$ add to $180°$

16.



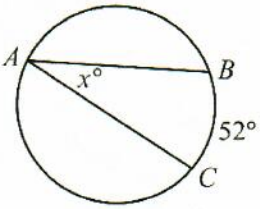

$4\cdot15=10\cdot x$
$60=10x$
$6=x$

17.



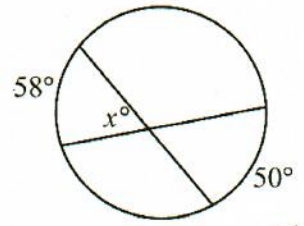

$x=2\cdot66=132°$
arc = 2 · inscribed angle

18.




$x=\frac{1}{2}\cdot52=26°$
inscribed angle = $\frac{1}{2}$ intercepted arc.

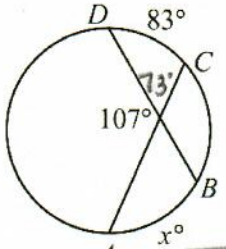
19.




$x = \frac{58+50}{2} = 54°$

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

20.



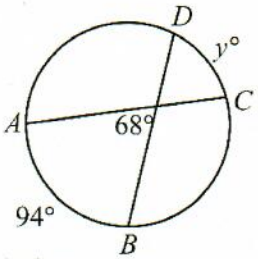

$73 = \frac{x+83}{2}$

$146 = x + 83$

$x = 63°$

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

21.




$68 = \frac{y+94}{2}$

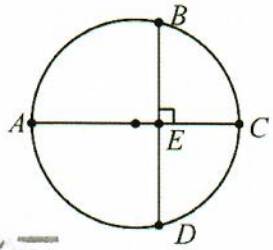
$136 = y + 94$

$42° = y$

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

**Name any congruent arcs or chords. State the REASON they are congruent.**

22.

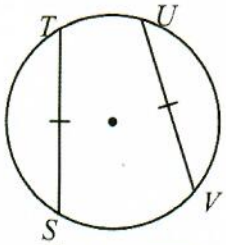



$\overline{EB} \cong \overline{ED}$

$\overset{\frown}{BC} \cong \overset{\frown}{DC}$

If diameter ⊥ chord, diameter bisects chord and arc.

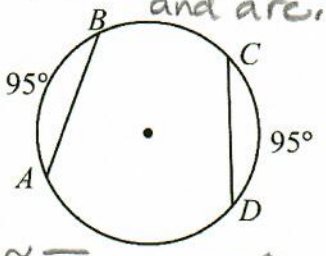
23.




$\overset{\frown}{TS} \cong \overline{UV}$

If chord ≅ chord, then arc ≅ arc.

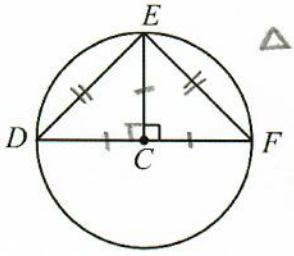
24.




$\overline{AB} \cong \overline{CD}$

If arc ≅ arc then chord ≅ chord

25.




$\triangle ECD \cong \triangle ECF$ (SAs)

$\overline{DE} \cong \overline{FE}$, ≅ triangles

$\overset{\frown}{DE} \cong \overset{\frown}{FE}$,

If chord ≅ chord, then arc ≅ arc.

**Write the standard equation of the circle with the given center and radius**

26. Center $(0, 0)$; Radius 4

$x^2 + y^2 = 16$

27. Center $(5, -7)$; Radius 9

$(x-5)^2 + (y+7)^2 = 81$

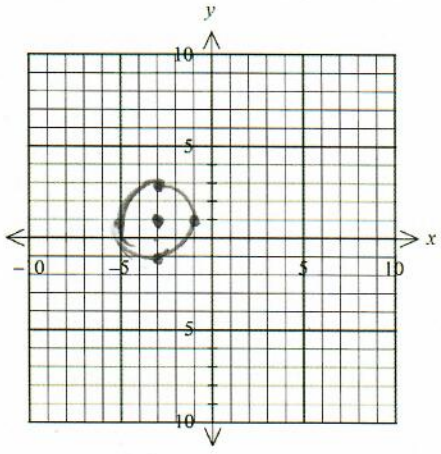
**Give the radius and coordinates of the center of each circle. Graph the circle.**

$x^2 - 8x + 16 + y^2 = 9$

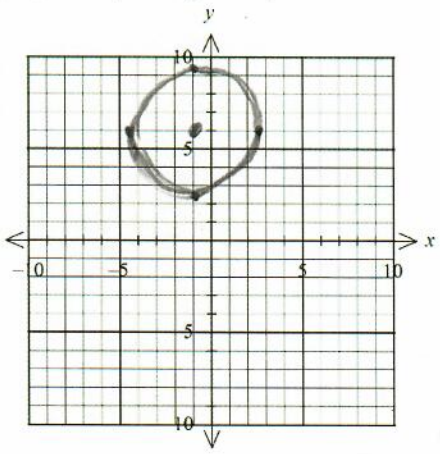
$-4 \qquad +16$

$(x-4)^2 + y^2 = 25$

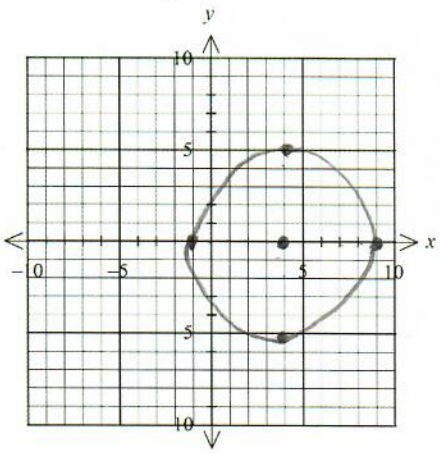
28. $(x + 3)^2 + (y - 1)^2 = 4$




29. $(x + 1)^2 + (y - 6)^2 = 13$

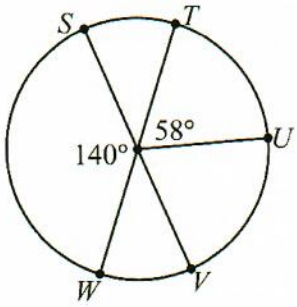



30. $x^2 - 8x + y^2 = 9$



**Find the measure of the arc or central angle indicated. Asume lines that appear to be diameters are actual diameters.**

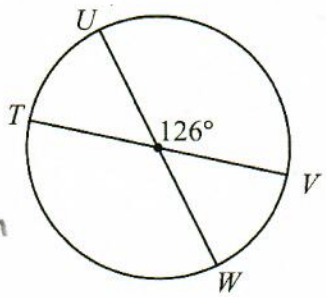
31.




$m\overset{\frown}{UW} = 122°$

Why? semicircle, angle addition postulate

32.

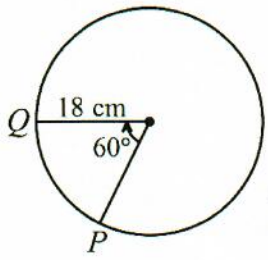



$m\overset{\frown}{VWU} = 360° - 126° = 234°$

Why? circle = 360° + angle addition postulate

**Find the length of each arc. Round your answer to the nearest hundredth.**

33.

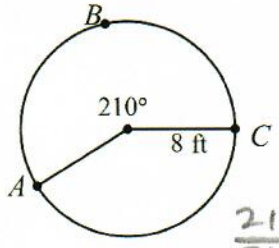



$m\overset{\frown}{PQ} = 18.85$ cm

$\frac{60}{360} \cdot 2\pi(18)$

$= \frac{2160}{360}\pi = 6\pi = 18.85$

34.



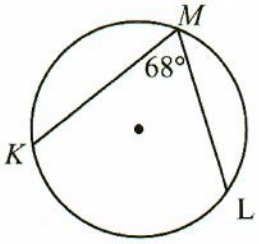

$m\overset{\frown}{CBA} = 29.32$ ft

$\frac{210}{360} \cdot 2\pi(8)$

$= \frac{3360}{360}\pi = \frac{28}{3}\pi = 29.32$

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

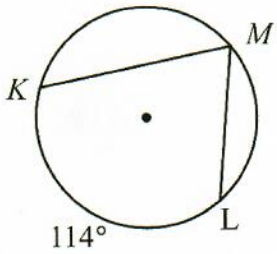
35.




$m\overset{\frown}{KL} = 2 \cdot 68° = 136°$

Why? arc = 2 · angle

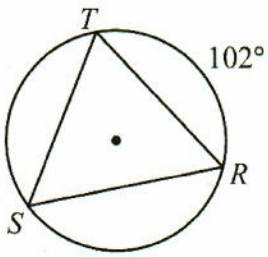
36.




$m\angle LMK = \frac{1}{2} \cdot 114 = 57°$

Why? angle = $\frac{1}{2}$ · arc

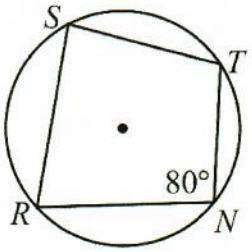
37.




$m\angle TSR = 360 - 102° = 258°$

Why? circle = 360°

38.

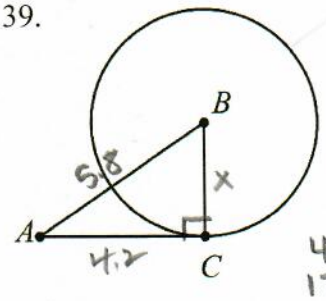



$m\angle RST = 180 - 80 = 100°$

Why? opposite angles are supplementary

**Find the segment length indicated. Assume lines which appear to be tangent are tangent.**

39.




$\overline{AB} = 5.8$

$\overline{AC} = 4.2$

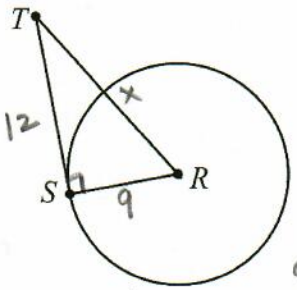
$\overline{BC} = \boxed{4}$

$4.2^2 + x^2 = 5.8^2$

$17.64 + x^2 = 33.64$

$x^2 = 16 \quad x = 4$

40.




$\overline{ST} = 12$

$\overline{SR} = 9$

$\overline{TR} = \boxed{15}$

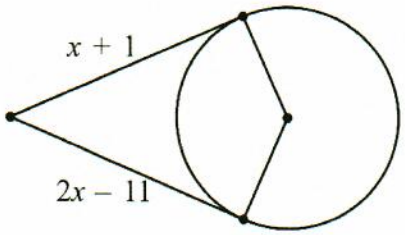
$9^2 + 12^2 = x^2$

$81 + 144 = x^2$

$225 = x^2 \quad x = 15$

**Solve for x. Assume lines that appear to be tangent are tangent. Give a REASON for your equation.**

41.

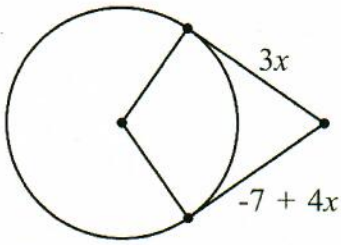



$x+1=2x-11$

$12=x$

tangent segments are congruent.

42.



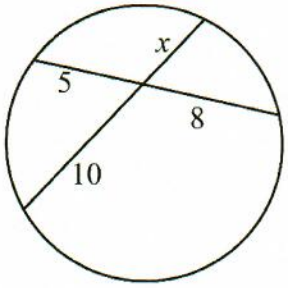

$3x=-7+4x$

$-x=-7$

$x=7$

tangent segments are congruent.

43.

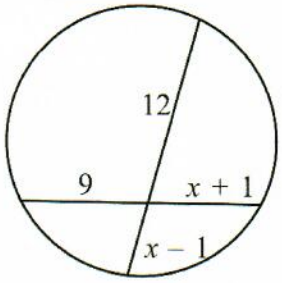



$5\cdot 8=x\cdot 10$

$40=10x$

$4=x$

44.




$12(x-1)=9(x+1)$

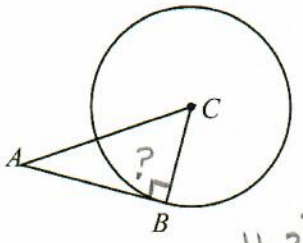
$12x-12=9x+9$

$3x=21$

$x=7$

**Determine if line AB is tangent to the circle. State a REASON.**

45.




$\overline{AB} = 11.2$

$\overline{BC} = 8.4$

$\overline{AC} = 14$

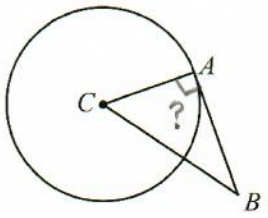
$11.2^2 + 8.4^2 \stackrel{?}{=} 14^2$

$125.44 + 70.56 \stackrel{?}{=} 196$

$196 = 196$

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

46.




$\overline{AC} = 9.8$

$\overline{CB} = 18$

$\overline{BA} = 14.4$

$9.8^2 + 14.4^2 \stackrel{?}{=} 18^2$

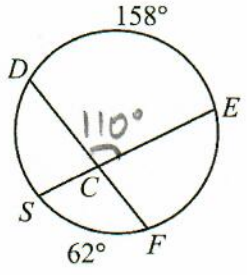
$96.04 + 207.36 \stackrel{?}{=} 324$

$303.4 \neq 324$

no, $a^2+b^2 \neq c^2$

**Find the value of *x*. Assume lines that appear to be tangent are tangent.**

47.



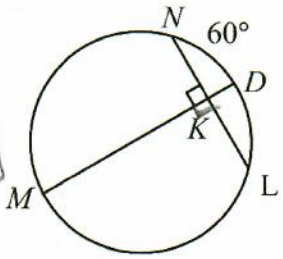

$m\overset{\frown}{ED} = 158°$

$m\overset{\frown}{SF} = 62°$

$m\angle DCE = ?$ $\frac{158+62}{2} = 110°$

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

48.




$m\overset{\frown}{ND} = 60°$

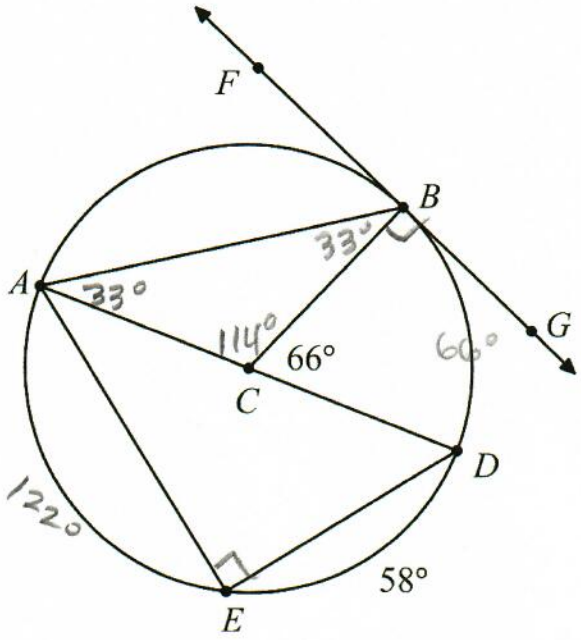
$m\overset{\frown}{ML} = ?$ $120°$

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

$90 = \frac{60+x}{2}$

$180 = 60 + x$

$120 = x$




$\overline{FG}$ is tangent to circle $C$

$\overline{AD}$ is a diameter of circle $C$

$m\overset{\frown}{ED} = 58°$

$m\angle BCD = 66°$

$m\overset{\frown}{BD} = 66°$
why? central angle

$m\angle BAD = \frac{1}{2} \cdot 66 = 33°$
why? angle = $\frac{1}{2}$ · arc

$m\angle AED = 90°$
why? right triangle, diameter = hypotenuse

$m\angle DAE = \frac{1}{2} \cdot 58 = 29°$
why? angle = $\frac{1}{2}$ · arc

$m\angle EDA = \frac{1}{2} \cdot 122 = 61°$
why? semicircle, angle addition postulate, angle = $\frac{1}{2}$ · arc

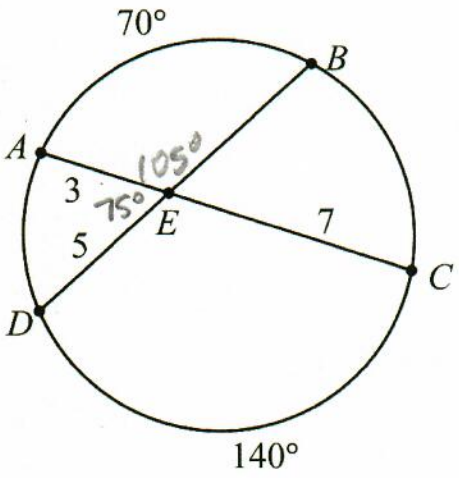
$m\overset{\frown}{AE} = 122°$
why? semi-circle 180 − 58°

$m\overset{\frown}{AB} = 114°$
why? linear pair, central angle

$m\angle CBF = 90°$
why? linear pair

$m\angle BCA = 114°$
why? linear pair

$m\angle CBA = 180° - 114° - 33° = 33°$
why? all angles in a △ add to 180°




$\overline{AE} = 3$

$\overline{ED} = 5$

$\overline{EC} = 7$

$m\overset{\frown}{AB} = 70°$

$m\overset{\frown}{DC} = 140°$

$m\angle AEB = \frac{70 + 140}{2} = 105°$
why? angle = $\frac{\text{arc} + \text{arc}}{2}$

$m\angle AED = 180 - 105 = 75°$
why? linear pair

$m\,\overline{EB} = 4.2$
why? $3 \cdot 7 = 5 \cdot x$

$21 = 5x$

$4.2 = x$