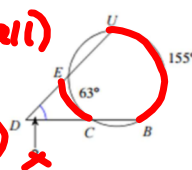
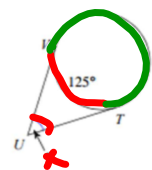


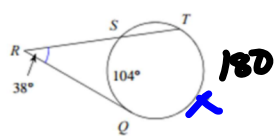
Bell Ringer - get out flashcards


Thursday 4/11

Solve for the missing measure.

1. 

2. 

3. 

4. 

$$x = \frac{1}{2}(\text{big} - \text{small})$$

$$x = \frac{1}{2}(155 - 63)$$

$$x = 46^\circ$$

$$238 \div 2 = (x - 104)$$

$$\begin{array}{r} 76 = x - 104 \\ + 104 \\ \hline 180 \end{array}$$

$$x = \frac{1}{2}(235 - 125)$$

$$\begin{array}{r} 360 \\ - 125 \\ \hline 235 \end{array} = \frac{1}{2}(110) = 55^\circ$$

$$x = \frac{1}{2}(\text{arc} + \text{arc})$$

$$x = \frac{1}{2}(90 + 70)$$

$$= \frac{1}{2}(160)$$

$$= 80$$

correct 12.10

$$(x-h)^2 + (y-k)^2 = r^2$$

(h, k) - center
 r - radius

12.10
 Equations of a Circle

Name Key Date _____ Hour _____

Ready

Find the equation of the following circles:

1. Center $(0, 0)$, radius of 6

$$x^2 + y^2 = 36$$

3. Center $(-1, -1)$, radius of 5

$$(x+1)^2 + (y+1)^2 = 25$$

- 😊 2. Center $(1, 2)$, radius of 3

$$(x-1)^2 + (y-2)^2 = 9$$

- 😊 4. Center of $(4, -2)$, radius of $\sqrt{50}$

$$(x-4)^2 + (y+2)^2 = 50$$

Set

Place each equation (#5-20) in the corresponding cells of the table below. Make up your own equation for any empty cells.

Equations:

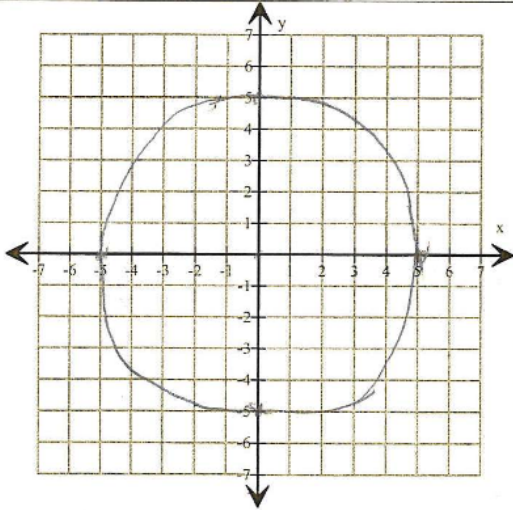
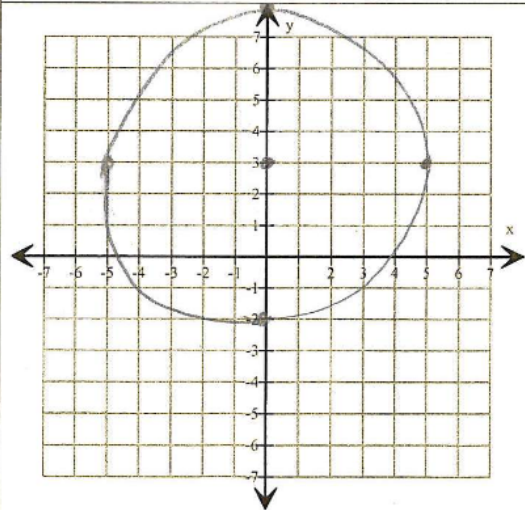
5. $(x-2)^2 + (y-1)^2 = 25$ $(2, 1)$ $r = 5$	6. $(x+2)^2 + (y-1)^2 - 100 = 0$ $(-2, 1)$ $r = 10$
7. $x^2 + (y+1)^2 = 25$ $(0, -1)$ $r = 5$	8. $(y-1)^2 + (x-2)^2 = 5$ $(2, 1)$ $r = \sqrt{5}$
9. $(x+2)^2 + (y-1)^2 = 10$ $(-2, 1)$ $r = \sqrt{10}$	10. $x^2 + (y+1)^2 = 100$ $(0, -1)$ $r = 10$
11. $(x-2)^2 + (y-1)^2 + 15 = 25$ $(2, 1)$ $r = \sqrt{10}$	12. $(x-2)^2 + (1+y)^2 = 100$ $(2, -1)$ $r = 10$
13. $(y+1)^2 + x^2 = 10$ $(0, -1)$ $r = \sqrt{10}$	14. $(x-2)^2 + (y+1)^2 = 10$ $(2, -1)$ $r = \sqrt{10}$
15. $(x-2)^2 + (y+1)^2 + 4 = 9$ $(2, -1)$ $r = \sqrt{5}$	16. $(y-1)^2 + (x+2)^2 = 25$ $(-2, 1)$ $r = 5$
17. $(x-2)^2 + (y-1)^2 = 100$	18. $(x-2)^2 + (y+1)^2 = 25$
19. $x^2 + (y+1)^2 = 10$	20. $(x+2)^2 + (y-1)^2 = 5$

Categorizing Equations

	Center at (2,1)	Center at (2,-1)	Center at (0,-1)	Center (-2, 1)
Radius of $\sqrt{5}$	8 😊	15	19 *	20 *
Radius of $\sqrt{10}$	11	14	13	9
Radius of 5	5	18 *	7 😊	16
Radius of 10	17 *	12 😊	10	6

Go!

Complete the missing entries in the table.

Equation	Equation
21. $x^2 + y^2 = 25$	😊 22. $x^2 + (y-3)^2 = 25$
Graph	Graph
	

Center, Point on Circle	Center, Point on Circle
Center $(0, 0)$	Center $(0, 3)$
Point $(0, 5)$	Point $(5, 3)$
Three Points on Circle	Three Points on Circle
$(-5, 0), (4, 5), (5, 0)$ $(3, 4), (3, 4), (3, -4)$	$(0, 0), (-5, 3), (0, -2)$

Equation

23. $(x+2)^2 + (y-1)^2 = 9$

Graph

Center, Point on Circle
Center $(-2, 1)$
Point $(1, 1)$
Three Points on Circle
$(-2, 4), (-5, 1), (-2, -2)$ $(0, 3.2), (0, 1.2), (-3, 3.8)$

Equation

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

Graph

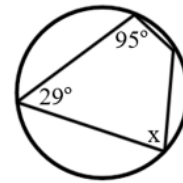
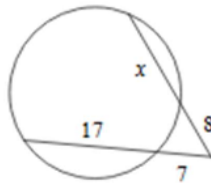
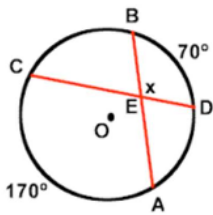
Center, Point on Circle
Center $(4, 4)$
Point $(4, 9)$
Three Points on Circle
$(4, -1)$ $(7, 8)$ $(9, 4)$ $(-1, 4)$

12.11 due tomorrow - questions?

Name: _____ Hour: _____

12.11 Review

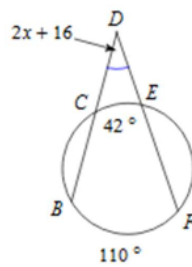
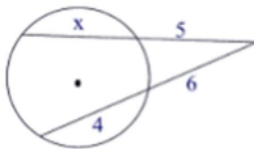
Solve for x.



1. _____

2. _____

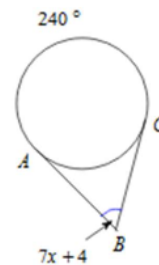
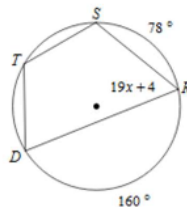
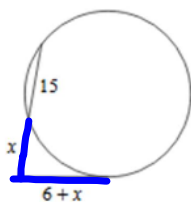
3. _____



4. _____

5. _____

6. _____

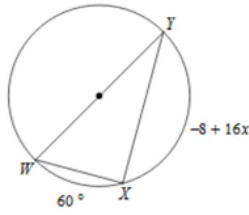


7. x = 12

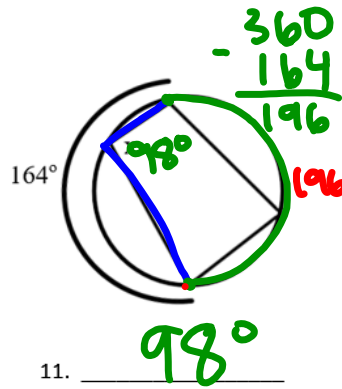
8. _____

9. _____

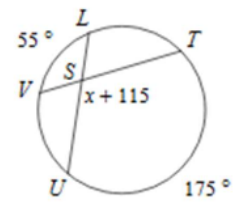
$$\begin{aligned}
 &x(x+15) = (6+x)(6+x) \\
 &x^2 + 15x = 36 + 6x + 6x + x^2 \\
 &\cancel{x^2} + 15x = 36 + \cancel{6x} + \cancel{6x} + \cancel{x^2} \\
 &15x = 36 + 12x \\
 &\cancel{-12x} \qquad \qquad \qquad \cancel{-12x} \\
 &3x = 36 \\
 &\frac{3x}{3} = \frac{36}{3} \\
 &x = 12
 \end{aligned}$$



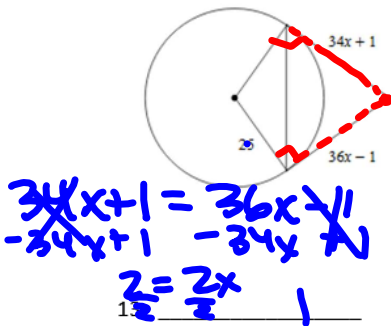
10. _____



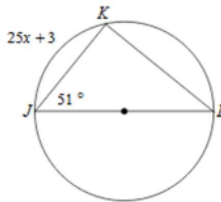
11. _____



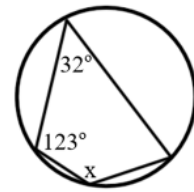
12. _____



13. _____

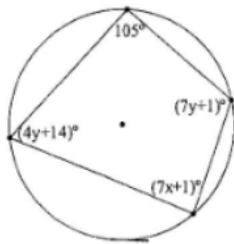


14. _____

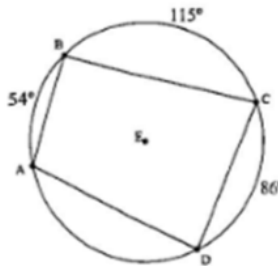


15. _____

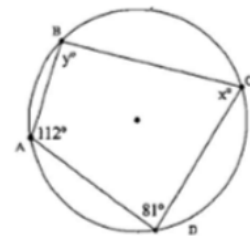
Find the value of the missing variables or parts. Round to the nearest tenth.



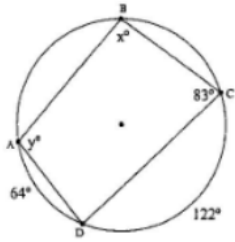
16. $x =$ _____
 $y =$ _____



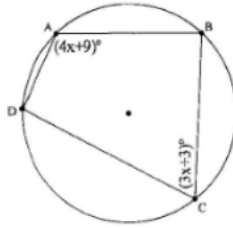
17. $m\angle A =$ _____
 $m\angle B =$ _____
 $m\angle C =$ _____
 $m\angle D =$ _____



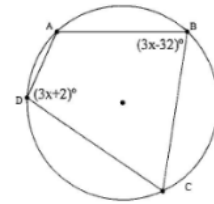
18. $x =$ _____
 $y =$ _____



19. $x =$ _____
 $y =$ _____

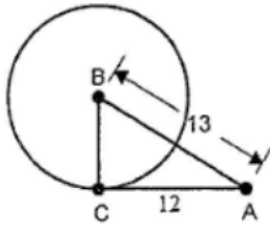


20. $x =$ _____

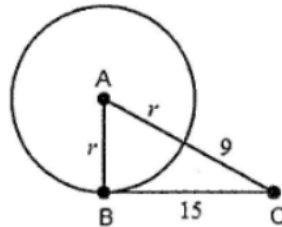


21. $x =$ _____

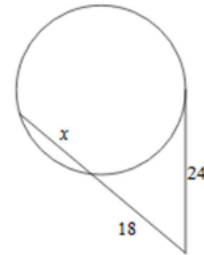
Find the value of the missing variables or parts. Assume that all lines that appear to be tangent to the circle are tangent to the circle. If necessary, round to the tenth.



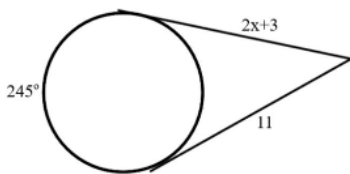
22. $\overline{BC} =$ _____



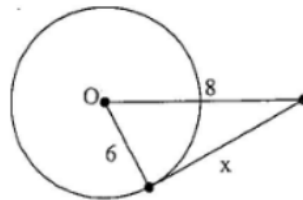
23. $r =$ _____



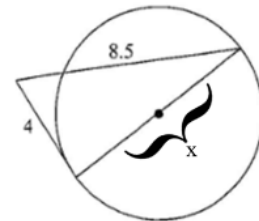
24. $x =$ _____



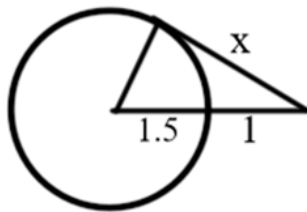
25. $x =$ _____



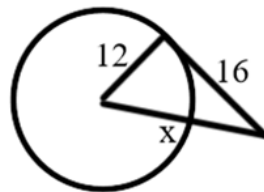
26. $x =$ _____



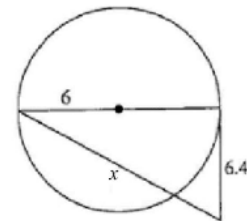
27. $x =$ _____



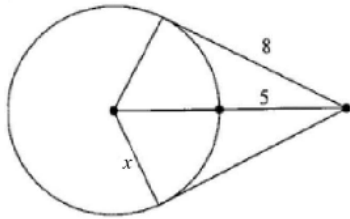
28. $x =$ _____



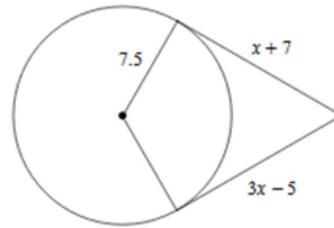
29. $x =$ _____



30. $x =$ _____

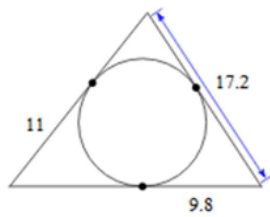


31. $x =$ _____

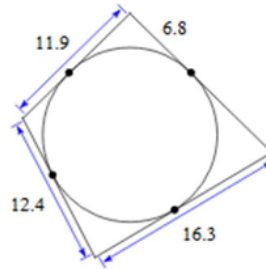


32. $x =$ _____

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

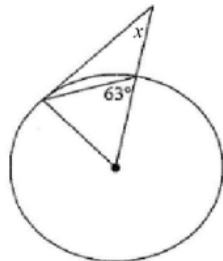


33. _____

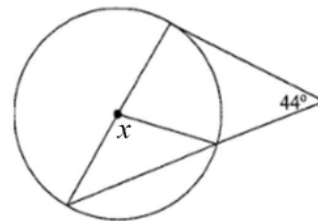


34. _____

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

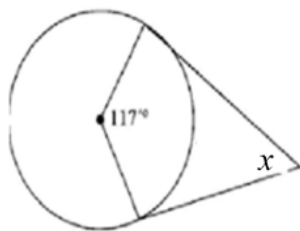


35. $x =$ _____

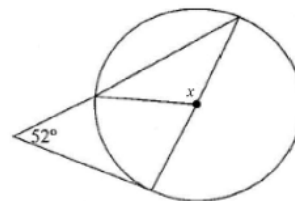


36. $x =$ _____

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



37. $x =$ _____



38. $x =$ _____

Review...

Write the equation of a circle with center $(-3, 0)$ and radius 5

$$(x + 3)^2 + y^2 = 25$$

Write the equation of a circle with center $(1, -2)$ and radius 2

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

Write the equation of a circle with a center $(0, 7)$
and an area of 49π

$$x^2 + (y - 7)^2 = 49$$

$$49\pi = \pi r^2$$

$$\sqrt{49} = \sqrt{r^2}$$

Write the equation of a circle with a center $(-6, -2)$
and an area of 17π

$$(x + 6)^2 + (y + 2)^2 = 17$$

$$\pi r^2 = 17\pi$$

$$r = \sqrt{17}$$

—

Write the equation of a circle with a center (0, 0)
and circumference of 50π

$$x^2 + y^2 = 25^2$$

$$x^2 + y^2 = 625$$

$$C = 2\pi r$$

$$\frac{50\pi}{(2\pi)} = \frac{2\pi r}{(2\pi)}$$

$$25 = r$$

Write the equation of a circle with a center (-4, -4)
and circumference of 11π

$$(x+4)^2 + (y+4)^2 = 30.25$$

$$\frac{11\pi}{2\pi} = \frac{2\pi r}{2\pi}$$

$$5.5 = r$$

5.5

Expand the standard form...

Standard form: $(x + 3)^2 + (y - 5)^2 = 16$

$$(x + 3)(x + 3) + (y - 5)(y - 5) = 16$$

$$x^2 + 6x + \underline{9} + y^2 - 10y + \underline{25} = 16$$

$$\left(\frac{b}{2}\right)^2$$

$$\frac{6}{2} \times \frac{6}{2}$$

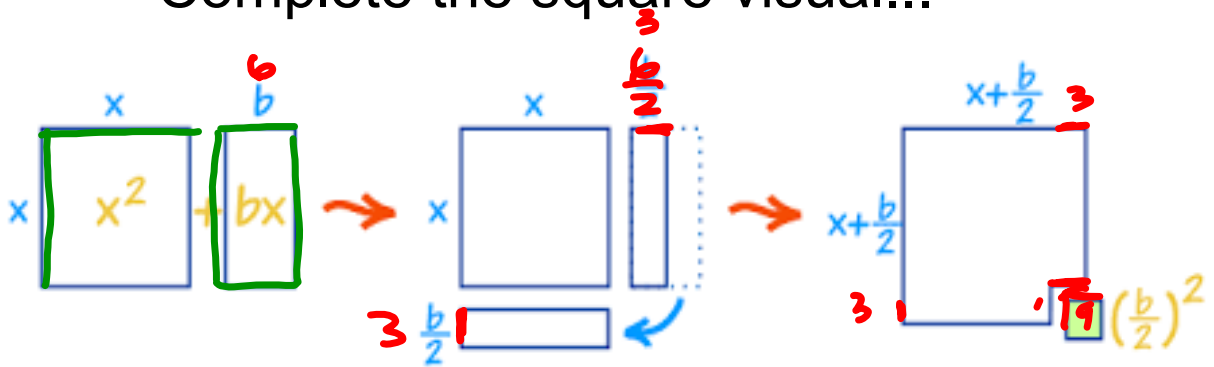
$$x^2 + \underline{6x} + \underline{9} + y^2 - 10y + \underline{25} = -18 + \underline{9+25}$$

$$\rightarrow \underline{x^2 + 6x} + \underline{y^2 - 10y} = -18 \quad \leftarrow \begin{array}{l} \text{group } x\text{'s} \\ \text{ \& } y\text{'s} \end{array}$$

$$\rightarrow x^2 + y^2 + 6x - 10y = -18$$

Explain how to go back to original...

Complete the square visual...



Complete the square

$$5. x^2 - 4x = 5$$

$$x^2 - 4x + 4 = 5 + 4$$

$$(x - 2)^2 = 9$$

$$(x-2)(x-2)$$

$$x^2 - 2x - 2x + 4$$

$$x^2 - 4x + 4$$

$$7. x^2 + 16x + 8 = 0$$

$$x^2 + 16x + 64 = -8 + 64$$

$$(x + 8)^2 = 56$$

$$(x+8)(x+8)$$

$$x^2 + 16x + 64$$

Write in standard form by completing the square, then give the center and radius of the circle

$$9. \underline{x^2} + \underline{y^2} + \underline{8x} - \underline{14y} + \cancel{61} = 0$$

$$x^2 + 8x + 16 + y^2 - 14y + 49 = -61 + 16 + 49$$

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

(center: $(-4, 7)$)
 $r = 2$

$= \sqrt{r^2}$

Write in standard form by completing the square, then give the center and radius of the circle

$$10. \underline{x^2} + \underline{y^2} + \underline{14x} + \underline{2y} + \overset{-4x}{\cancel{49}} - \overset{-49}{\cancel{49}} = 0$$

$$\underline{x^2 + 14x + 49} + \underline{y^2 + 2y + 1} = -49 + \underline{49 + 1}$$

$$(x+7)^2 + (y+1)^2 = 1$$

$$\text{Center: } (-7, -1) \quad = \sqrt{r^2}$$

$$r = 1$$

Complete the square to write equation in standard form!

Flashcard Instructions...

1. Group the x's and y's together putting the constant on the other side of the equation.
2. Half the linear coefficients and write in the parentheses.
3. Square what you wrote in the parentheses and add it to the constant.

Problem: $x^2 + y^2 + 14x + 2y + 49 = 0$

1. $x^2 + \underline{14x} + y^2 + \underline{2y} - 49 + \underline{49} + 1$

2. $(x + \underline{7})^2 + (y + \underline{1})^2$

3. $(x + 7)^2 + (y + 1)^2 = -49 + 49 + 1$

Answer: $(x + 7)^2 + (y + 1)^2 = 1$

due Monday

Name _____ Hour _____

12.12 Equations of a Circle by Completing the Square

Practice Completing the Square:

~~1. $x^2 - 4x = 5$~~

~~2. $x^2 - 2x$~~

~~3. $x^2 - 2x$~~

~~4. $x^2 + 12x$~~

5. $x^2 - 4x = 5$

6. $x^2 - 5x = 10$

7. $x^2 + 16x + 8 = 0$

8. $x^2 + 10x + 15 = 0$

Write the equation of the following circles in standard form. Then identify the center and radius.

9. $x^2 + y^2 + 8x - 14y + 61 = 0$

10. $x^2 + y^2 + 14x + 2y + 49 = 0$

11. $x^2 + y^2 + 6x + 14y + 49 = 0$

$$\begin{aligned}
 &12. \quad x^2 + y^2 - 10x + 20y + 61 = 0 \\
 &x^2 - 10x + \underline{25} + y^2 + 20y + \underline{100} = -61 + \underline{125} \\
 &(x - 5)^2 + (y + 10)^2 = 64 \\
 &(5, -10) \quad r = 8
 \end{aligned}$$

13. $x^2 + y^2 + 2x - 10y + 10 = 0$

14. $x^2 + y^2 - 8x + 2y - 8 = 0$

15. $x^2 + y^2 + 4x + 18y + 84 = 0$

~~16. $4y^2 + y^2 = -28x - x^2 - 191$~~

Use the following information provided to write the standard form equation of each circle.

17. *Center:* $(-11, -14)$ and *Area:* 16π

18. *Center:* $(-5, 12)$ and *Area:* 36π

19. *Center:* $(10, -4)$ and *Circumference:* 4π

20. *Center:* $(15, 14)$ and *Circumference:* $2\pi\sqrt{15}$

21. *Center:* $(14, 17)$ and *a point on the circle* $(15, 17)$.

~~22. *Center:* $(-2, -3)$ and *a point on the circle* $(4, 0)$.~~

