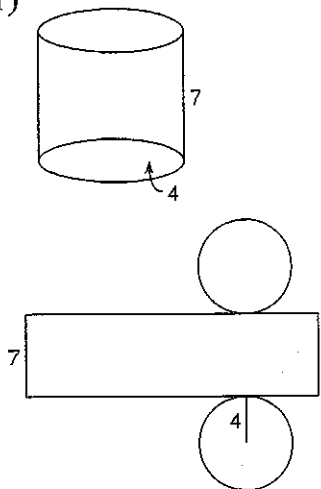


Monday April 11	Surface Area-Prisms and Cylinders -Notes page 1 -Classwork/HW page 2
Tuesday April 12	Surface Area- Cones and Square Pyramids -Classwork/HW pages 3-4
Wednesday April 13	Surface Area- Spheres -Classwork/HW pages 5-6
Thursday April 14	Distance Formula and Midpoint Formula -Classwork/HW pages 7-8
Friday April 15	Writing Equations of Circles -Notes page 9 -Classwork/HW page 10
Monday April 18	Writing Equations Cont'd -Notes pages 11-12 -Classwork/HW pages 13-15
Tuesday April 19	Writing Equations and Graphing Circles -Classwork/HW pages 16-19
Wednesday April 20	<b>QUIZ</b>
Thursday April 21	Constructions- Inscribed Circles
Friday April 22	Constructions- Circumscribed Circles
Monday April 25	Constructions- Tangent Line
Tuesday April 26	Constructions- Mixed Review
Wednesday April 27	Review Day
Thursday April 28	<b>TEST</b>
Friday April 29	Independent Probability
Monday May 2	Conditional Probability
Tuesday May 3	Angles (vertical, liner, parallel lines cut by transversals)
Wednesday May 4	Transformations (reflections, rotations, translations)
Thursday May 5	Congruent and Similar Triangles
Friday May 6	Right Triangle Trig (45-45-90, 30-60-90, sin, cos, tan)
Monday May 9	Unit 4A- Central and Inscribed Angles Circles
Tuesday May 10	<b>PRACTICE TEST</b>
Wednesday May 11	<b>EOCT</b>
	Two-way Tables and Probability of Compound Events

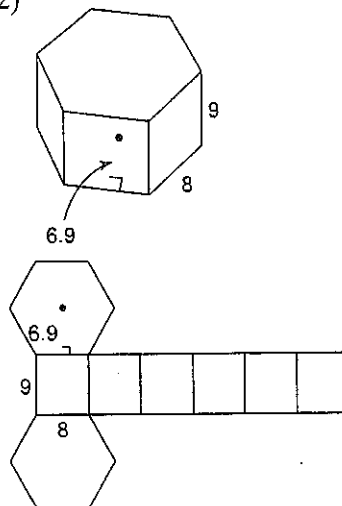
# Surface Area of Prisms and Cylinders

Copy the measurements given onto the net of each solid.

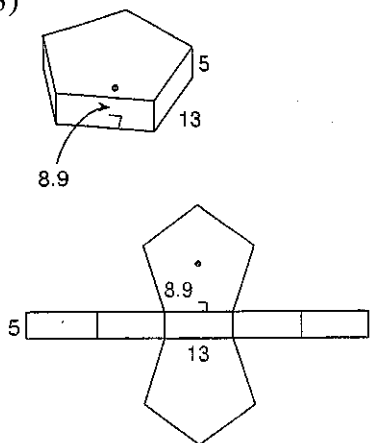
1)



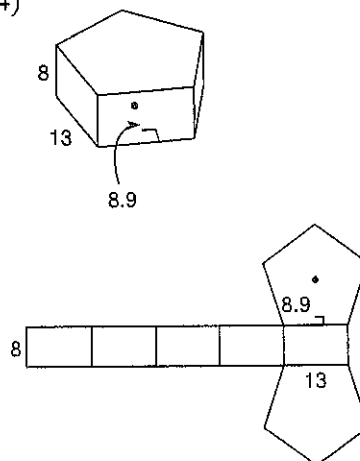
2)



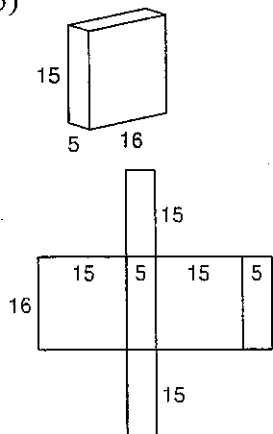
3)



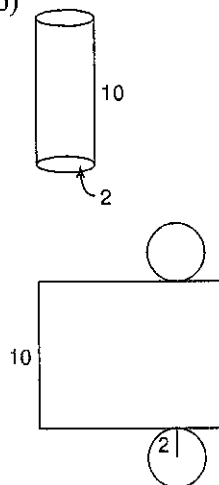
4)



5)



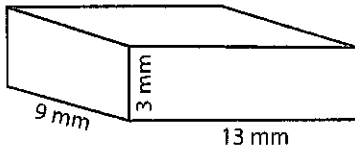
6)



### Answer Key

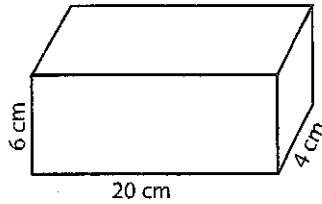
Find the surface area of each rectangular prism.

1)



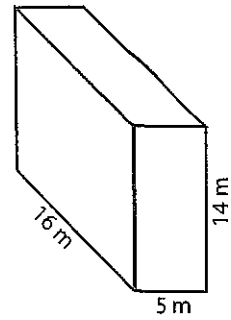
Surface Area = 366 mm<sup>2</sup>

2)



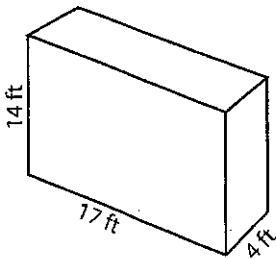
Surface Area = 448 cm<sup>2</sup>

3)



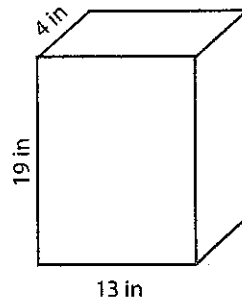
Surface Area = 748 m<sup>2</sup>

4)



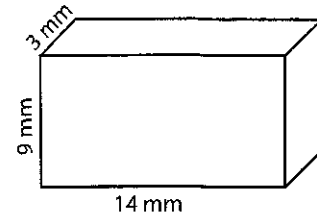
Surface Area = 724 ft<sup>2</sup>

5)



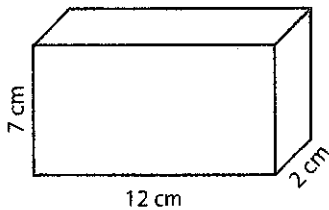
Surface Area = 750 in<sup>2</sup>

6)



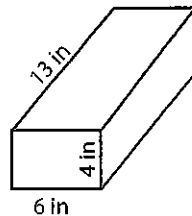
Surface Area = 390 mm<sup>2</sup>

7)



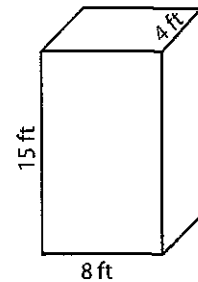
Surface Area = 244 cm<sup>2</sup>

8)



Surface Area = 308 in<sup>2</sup>

9)



Surface Area = 424 ft<sup>2</sup>

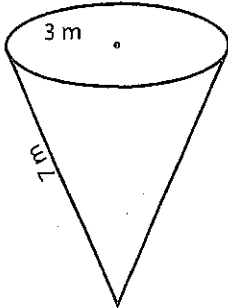
10) A gift box in the shape of a rectangular prism has 20 centimeters length, 14 centimeters width and 10 centimeters height. How much the paper will you need to wrap the gift box?

Surface Area = 1240 cm<sup>2</sup>

**Answer Key**

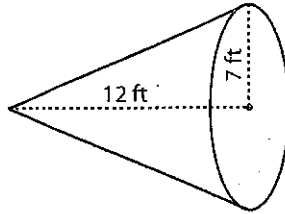
Find the surface area of each cone. Round the answer to nearest tenth. ( use  $\pi = 3.14$  )

1)



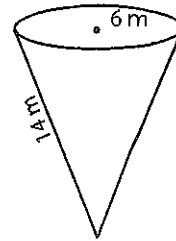
Surface Area = 94.2 m<sup>2</sup>

2)



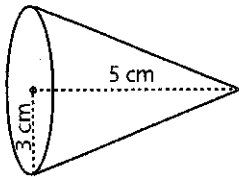
Surface Area = 459.2 ft<sup>2</sup>

3)



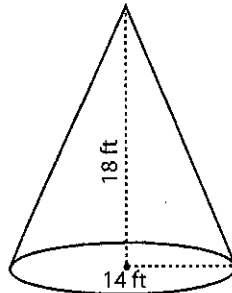
Surface Area = 376.8 m<sup>2</sup>

4)



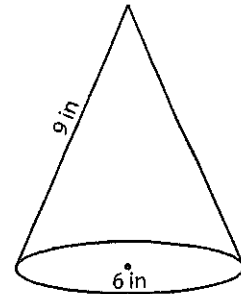
Surface Area = 83.2 cm<sup>2</sup>

5)



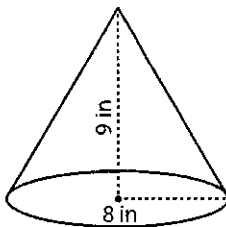
Surface Area = 578.4 ft<sup>2</sup>

6)



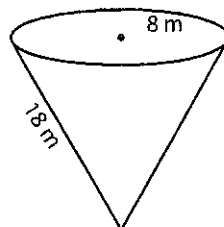
Surface Area = 113 in<sup>2</sup>

7)



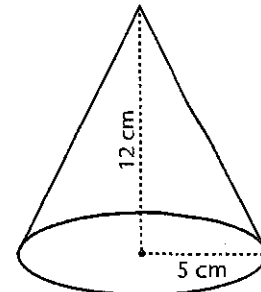
Surface Area = 173.9 in<sup>2</sup>

8)



Surface Area = 653.1 m<sup>2</sup>

9)

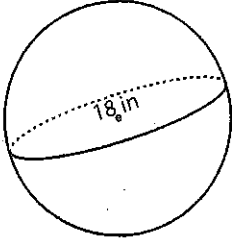


Surface Area = 282.6 cm<sup>2</sup>

**Answer Key**

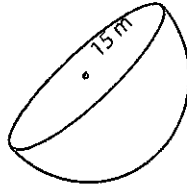
Find the exact surface area of each shape.

1)



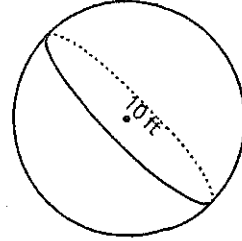
Surface Area =  $324\pi \text{ in}^2$

2)



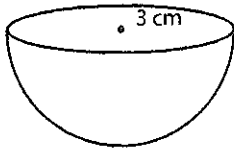
Surface Area =  $675\pi \text{ m}^2$

3)



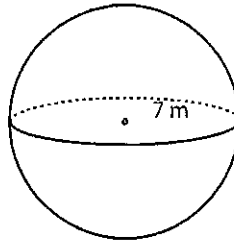
Surface Area =  $100\pi \text{ ft}^2$

4)



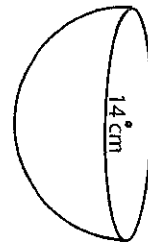
Surface Area =  $27\pi \text{ cm}^2$

5)



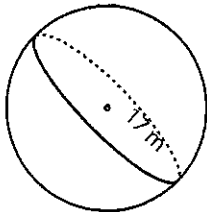
Surface Area =  $196\pi \text{ m}^2$

6)



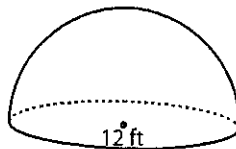
Surface Area =  $147\pi \text{ cm}^2$

7)



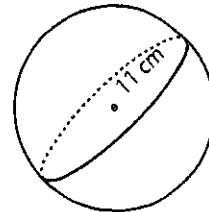
Surface Area =  $1156\pi \text{ m}^2$

8)



Surface Area =  $108\pi \text{ ft}^2$

9)

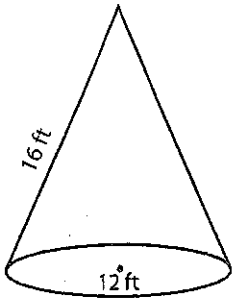


Surface Area =  $484\pi \text{ cm}^2$

### Answer Key

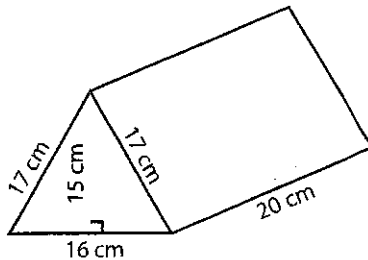
Find the exact surface area of each shape.

1)



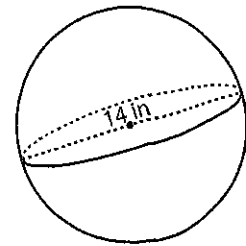
Surface Area =  $132\pi \text{ ft}^2$

2)



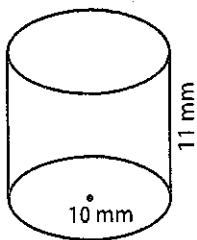
Surface Area =  $1240 \text{ cm}^2$

3)



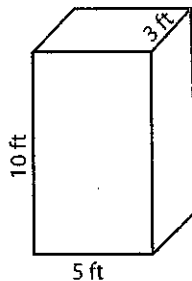
Surface Area =  $196\pi \text{ in}^2$

4)



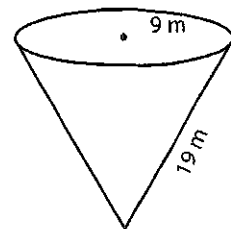
Surface Area =  $160\pi \text{ mm}^2$

5)



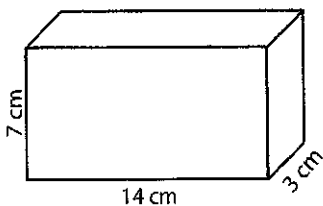
Surface Area =  $190 \text{ ft}^2$

6)



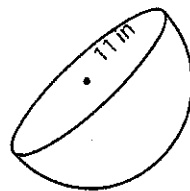
Surface Area =  $252\pi \text{ m}^2$

7)



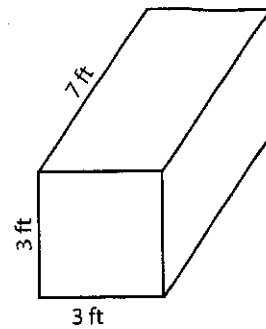
Surface Area =  $322 \text{ cm}^2$

8)



Surface Area =  $363\pi \text{ in}^2$

9)

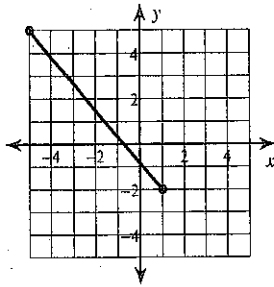


Surface Area =  $102 \text{ ft}^2$

The Distance Formula

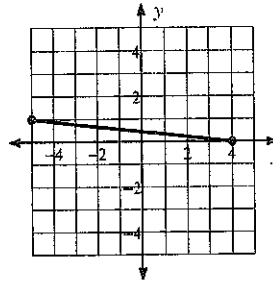
Find the distance between each pair of points. Round your answer to the nearest tenth, if necessary.

1)



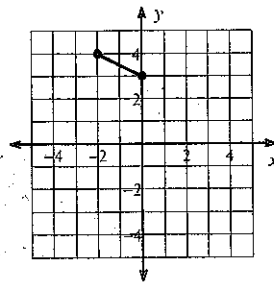
9.2

2)



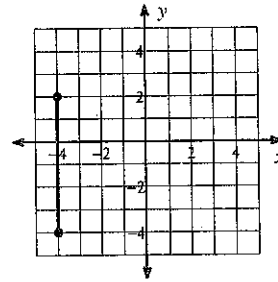
9.1

3)



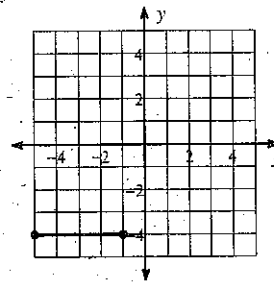
2.2

4)



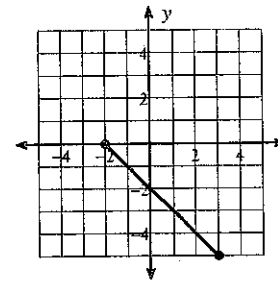
6

5)



4

6)



7.1

7)  $(-2, 3), (-7, -7)$

11.2

8)  $(2, -9), (-1, 4)$

13.3

9)  $(5, 9), (-7, -7)$

20

10)  $(8, 5), (-1, 3)$

9.2

11)  $(-10, -7), (-8, 1)$

8.2

12)  $(-6, -10), (-2, -10)$

4

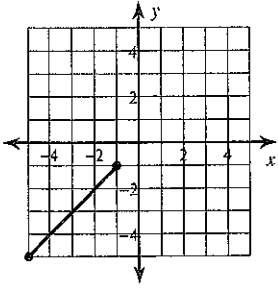
## The Midpoint Formula

Date \_\_\_\_\_

Period \_\_\_\_\_

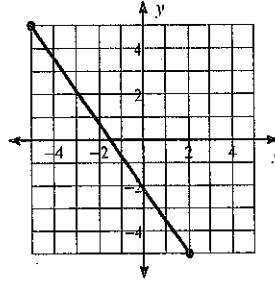
Find the midpoint of each line segment.

1)



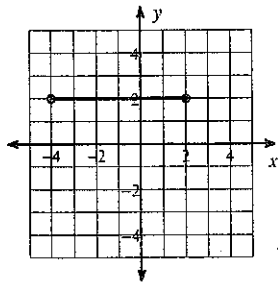
$$(-3, -3)$$

2)



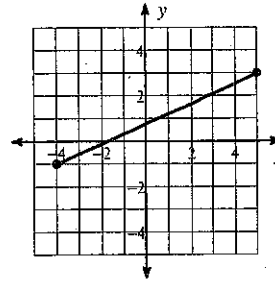
$$\left(-1\frac{1}{2}, 0\right)$$

3)



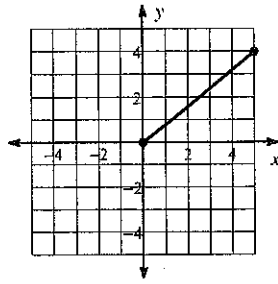
$$(-1, 2)$$

4)



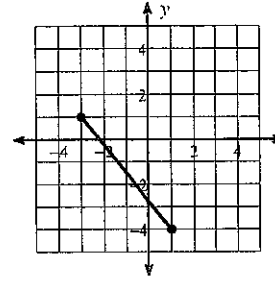
$$\left(\frac{1}{2}, 1\right)$$

5)



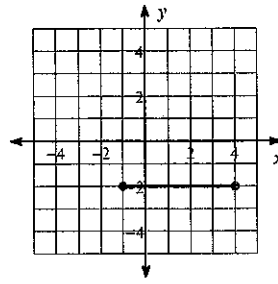
$$\left(2\frac{1}{2}, 2\right)$$

6)



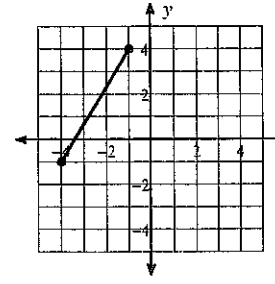
$$\left(-1, -1\frac{1}{2}\right)$$

7)



$$\left(1\frac{1}{2}, -2\right)$$

8)



$$\left(-2\frac{1}{2}, 1\frac{1}{2}\right)$$



key

## Circles - Notes Day 1

General Form of the Equation of a Circle:

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

Center:  $(h, k)$  and radius =  $r$

Given the center and radius, write the equation.

1. C (5, 2)  $r = 7$

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

$$x^2 - 10x + 25 + y^2 - 4y + 4 = 49$$

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

Equation:  $x^2 + y^2 - 10x - 4y - 20 = 0$

2. C (-3, 4)  $r = 2\sqrt{5}$

$$(x+3)(x+3) + (y-4)(y-4) = (2\sqrt{5})^2$$

$$x^2 + 6x + 9 + y^2 - 8y + 16 = 20$$

$$(x + 3)^2 + (y - 4)^2 = (2\sqrt{5})^2$$

Equation:  $x^2 + y^2 + 6x - 8y + 5 = 0$

Given the center and another point on the circle, write the equation.

To find  $r^2$  either plug in the point or use the distance formula,  $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ .

3. C (4, -7) and (5, 3)

$$(x-4)^2 + (y+7)^2 = 101$$

$$x^2 - 8x + 16 + y^2 + 14y + 49 = 101$$

Equation:  $x^2 + y^2 - 8x + 14y - 36 = 0$

Find  $r^2$  by plugging in the point (5, 3):

$$(5-4)^2 + (3+7)^2 = r^2$$

$$(1)^2 + (10)^2 = r^2$$

$$1 + 100 = r^2$$

$$101 = r^2$$

4. C (0, 0) origin and (-5, 2)

$$(x - 0)^2 + (y - 0)^2 = (29)^2$$

Equation:  $x^2 + y^2 - 29 = 0$

Find  $r^2$  using the distance formula:

$$d = \sqrt{(2-0)^2 + (-5-0)^2}$$

$$= \sqrt{4 + 25}$$

$$= \sqrt{29} = \text{radius}$$

## Circles Worksheet Day #1

Write an equation of a circle given the following information.

	Center	Radius	Equation
1.	(2, -4)	4	$(x-2)^2 + (y+4)^2 = 16$
2.	(-7, 1)	15	$(x+7)^2 + (y-1)^2 = 225$
3.	(3, 0)	1/3	$(x-3)^2 + y^2 = 1/9$
4.	(-5, -3)	$3\sqrt{2}$	$(x+5)^2 + (y+3)^2 = 18$

Write an equation of each circle described below. Show work!

5. Given a circle with center (3, -4) and passing through (6, 2).

$$(x-3)^2 + (y+4)^2 = 45$$

$$d = \sqrt{(3-6)^2 + (-4-2)^2} = \sqrt{9+36}$$

6. Given a circle with the center (5, 1) and a point on the circle (8, -2).

$$(x-5)^2 + (y-1)^2 = 18$$

$$d = \sqrt{(8-5)^2 + (-2-1)^2} = \sqrt{9+9}$$

7. Given a circle with the center at the origin and passing through (4, 3).

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

$$d = \sqrt{(4-0)^2 + (3-0)^2} = \sqrt{16+9}$$

Extension (Hint: find the coordinates of the center first)

8. Given a circle with (5, 1) and (3, -1) as the endpoints of the diameter

$$C = \left( \frac{5+3}{2}, \frac{1+(-1)}{2} \right)$$

$$d = \sqrt{(4-5)^2 + (0-1)^2}$$

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

$$C = (4, 0)$$

$$d = \sqrt{1+1}$$

$$d = \sqrt{2} = r$$

9. Given a circle with (2, 1) and (6, -3) as the endpoints of the diameter.

$$C = \left( \frac{2+6}{2}, \frac{1+(-3)}{2} \right)$$

$$r = d = \sqrt{(4-2)^2 + (-1-1)^2}$$

$$(x-4)^2 + (y+1)^2 = 8$$

$$C = (4, -1)$$

$$= \sqrt{4+4}$$

$$= \sqrt{8}$$

10. Given a circle with (4, -3) and (2, 1) as the endpoints of the diameter.

$$C = \left( \frac{4+2}{2}, \frac{-3+1}{2} \right)$$

$$r = d = \sqrt{(3-4)^2 + (-1+3)^2}$$

$$(x-3)^2 + (y+1)^2 = 5$$

$$C = (3, -1)$$

$$= \sqrt{1+4}$$

$$r = \sqrt{5}$$

## Circles Notes Day 2

### Part 1: Rewriting equation in standard form

If the quadratic equation isn't in the standard form for a circle:

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

we must first complete the square to get it in the correct form.

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

1.  $x^2 + y^2 + 16x - 22y - 20 = 0$

$$(x^2 + 16x + \underline{64}) + (y^2 - 22y + \underline{121}) = 20 + \underline{64} + \underline{121}$$

$$(x+8)^2 + (y-11)^2 = 205$$

#### Steps to complete the square.

First, prepare the terms:

✓ Group X and leave a space.

✓ Group y and leave a space.

✓ Move the constant and leave \_\_\_\_\_

Then, complete the square:

✓  $\frac{1}{2}$  the linear term and square it.

✓ Add to both sides.

✓ Do this for both x and y.

✓ Factor and simplify.

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

2.  $x^2 + y^2 - 12x + 8y + 32 = 0$

$$(x^2 - 12x + \underline{36}) + (y^2 + 8y + \underline{16}) = -32 + \underline{36} + \underline{16}$$

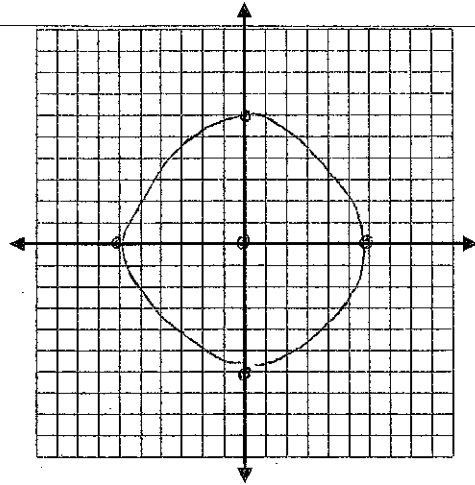
$$(x-6)^2 + (y+4)^2 = 20$$

Part 2: Graphing Circles

1.  $(x)^2 + (y)^2 = 36$

$C = (0, 0)$

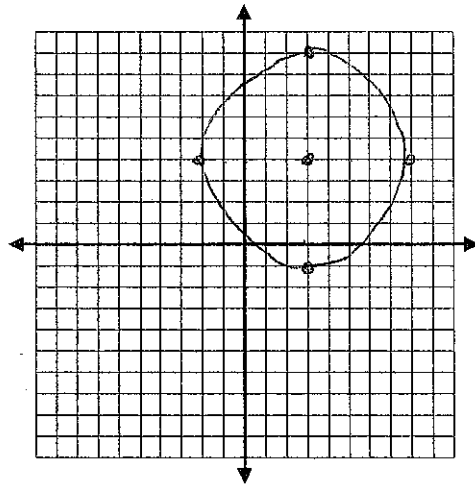
$r = \underline{6}$



2.  $(x-3)^2 + (y-4)^2 = 25$

$C = (3, 4)$

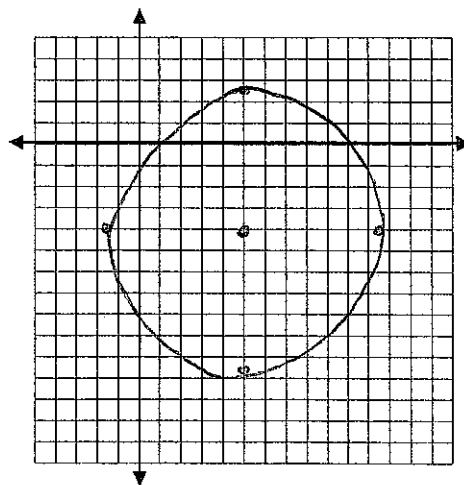
$r = \underline{5}$



3.  $(x-5)^2 + (y+4)^2 = 41$

$C = (5, -4)$

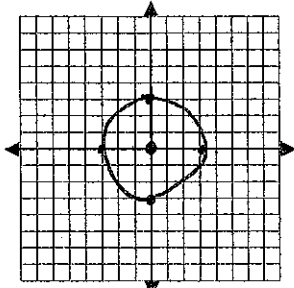
$r = \underline{6.4}$



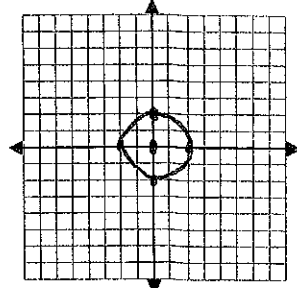
Circles Worksheet Day #2

Put each equation in standard form and graph the circle.

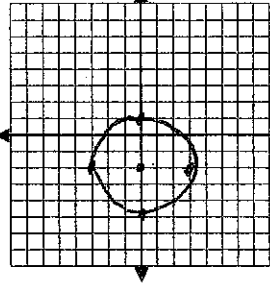
1.  $x^2 = 9 - y^2$   
 $x^2 + y^2 = 9$



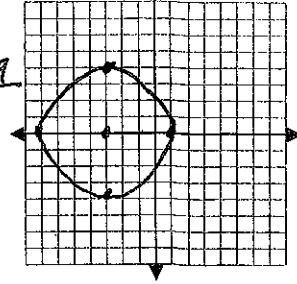
2.  $\frac{2x^2}{2} + \frac{2y^2}{2} - \frac{8}{2} = 0$   
 $x^2 + y^2 = 4$



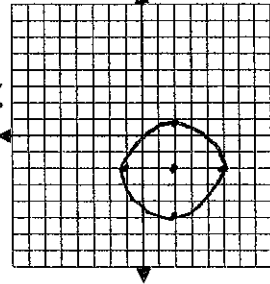
3.  $x^2 + y^2 + 4y + 4 = 9$   
 $(x^2) + (y^2 + 4y + 4) = 5 + 4$   
 $x^2 + (y + 2)^2 = 9$



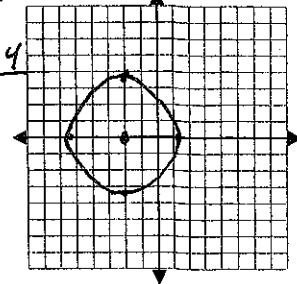
4.  $x^2 + 6x + y^2 = 7$   
 $(x^2 + 6x + 9) + (y^2) = 7 + 9$   
 $(x + 3)^2 + y^2 = 16$



5.  $y^2 + x^2 + 4x - 4y - 1 = 0$   
 $(x^2 + 4x + 4) + (y^2 - 4y + 4) = 1 + 4 + 4$   
 $(x + 2)^2 + (y - 2)^2 = 9$

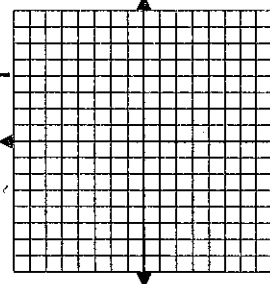


6.  $\frac{5x^2}{5} + \frac{20x}{5} + \frac{5y^2}{5} = \frac{35}{5}$   
 $(x^2 + 4x + 4) + y^2 = 7 + 4$   
 $(x + 2)^2 + y^2 = 11$

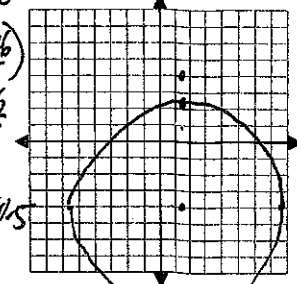


$r \approx 3.3$

7.  $\frac{4x^2}{4} + \frac{4y^2}{4} + \frac{32y}{4} - \frac{36}{4} = 0$   
 $x^2 + (y^2 + 8y + 16) = 9 + 16$   
 $x^2 + (y + 4)^2 = 25$

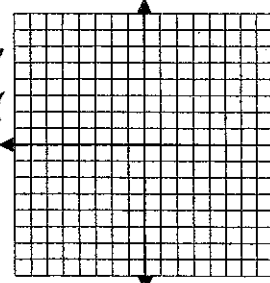


8.  $x^2 + y^2 - 3x + 8y = 20$   
 $(x^2 - 3x + \frac{9}{4}) + (y^2 + 8y + 16) = 20 + \frac{9}{4} + 16$   
 $(x - \frac{3}{2})^2 + (y + 4)^2 = 40\frac{1}{4}$

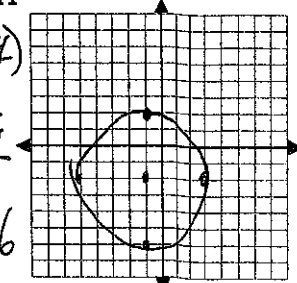


$r \approx 6.4$

9.  $x^2 - 12x + 84 = -y^2 + 16y$   
 $(x^2 - 12x + 36) + (y^2 - 16y + 64) = -84 + 36 + 64$   
 $(x - 6)^2 + (y - 8)^2 = 16$



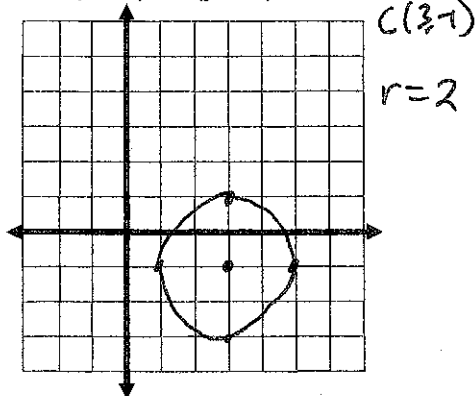
10.  $x^2 + y^2 + 2x + 4y = 11$   
 $(x^2 + 2x + 1) + (y^2 + 4y + 4) = 11 + 1 + 4$   
 $(x + 1)^2 + (y + 2)^2 = 16$



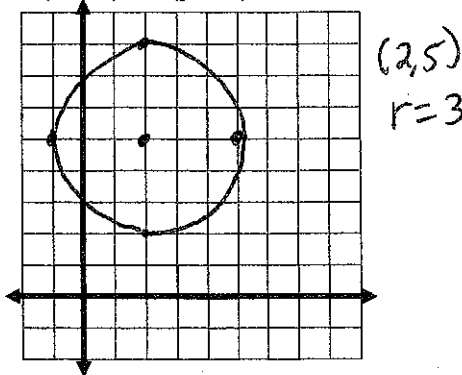
Note: If  $r^2$  is not a perfect square then leave  $r$  in simplified radical form but use the decimal equivalent for graphing. Example:  $\sqrt{12} = 2\sqrt{3} = 3.46$

1) **Graph the following circle:**

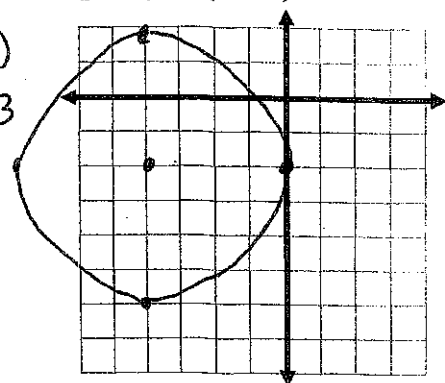
a.  $(x - 3)^2 + (y + 1)^2 = 4$



b.  $(x - 2)^2 + (y - 5)^2 = 9$



c.  $(y + 4)^2 + (x + 2)^2 = 16$



2) **For each circle: Identify its center and radius.**

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

Center:  $(-3, 1)$

Radius:  $2$

b.  $x^2 + (y - 3)^2 = 18$

Center:  $(0, 3)$

Radius:  $3\sqrt{2}$

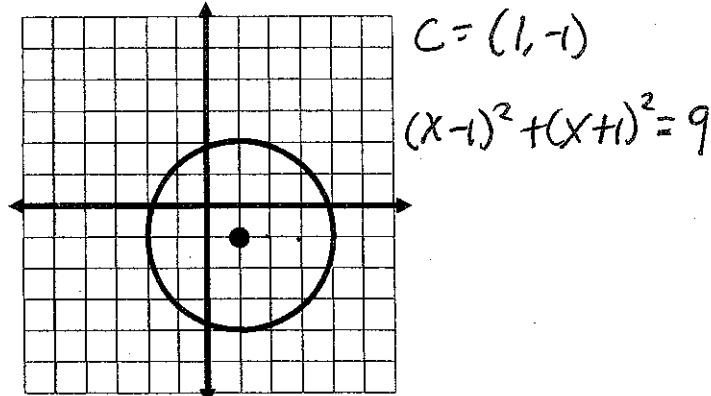
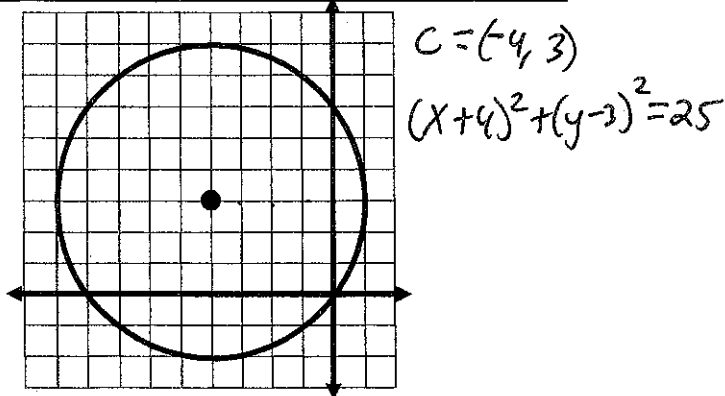
c.  $(y + 8)^2 + (x + 2)^2 = 72$

Center:  $(-2, -8)$

Radius:  $6\sqrt{2}$

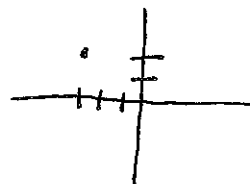
$\sqrt{72}$   
 $\wedge$   
 $36 \cdot 2$

3) **Write the equation of the following circles:**



4) Give the equation of the circle that is tangent to the y-axis and center is  $(-3, 2)$ .

$(x + 3)^2 + (y - 2)^2 = 9$



5) **Compare and contrast the following pairs of circles**

a. Circle #1:  $(x - 3)^2 + (y + 1)^2 = 25$

Circle #2:  $(x + 1)^2 + (y - 2)^2 = 25$

center 1:  $(3, -1)$   $r = 5$

center 2:  $(-1, 2)$   $r = 5$

b. Circle #1:  $(y + 4)^2 + (x + 7)^2 = 6$

Circle #2:  $(x + 7)^2 + (y + 4)^2 = 36$

#1  $(-7, -4)$   $C = \sqrt{6}$

#2  $(-7, -4)$   $C = 6$

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Example 1:  $x^2 + y^2 + 6x - 8y - 11 = 0$

$(x^2 + 6x) + (y^2 - 8y) = 11$

$(x^2 + 6x + 9) + (y^2 - 8y + 16) = 11 + 9 + 16$

$(x+3)^2 + (y-4)^2 = 36$

Center: (-3, 4) Radius: 6

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

Example 2:  $x^2 + y^2 - 2x + 6y - 10 = 0$

$(x^2 - 2x + 1) + (y^2 + 6y + 9) = 10 + 1 + 9$

$(x-1)^2 + (y+3)^2 = 20$

Center: (1, -3) Radius:  $2\sqrt{5}$

6) Find the standard form, center, and radius of the following circles:

6a)  $x^2 + y^2 - 4x + 8y - 5 = 0$

$(x^2 - 4x + 4) + (y^2 + 8y + 16) = 5 + 4 + 16$

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

Center: (2, -4)

Radius: 5

6b)  $4x^2 + 4y^2 + 36y + 5 = 0$

$x^2 + (y^2 + 9y + \frac{81}{4}) = -\frac{5}{4}$

Center: \_\_\_\_\_

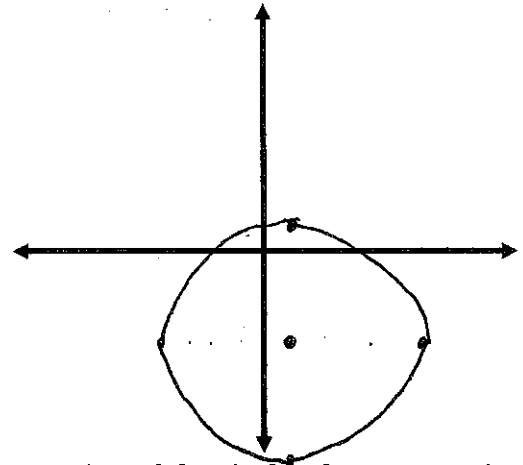
Radius: \_\_\_\_\_

7) Graph the following circles:

7a)  $x^2 - 2x + y^2 + 8y - 8 = 0$

$(x^2 - 2x + 1) + (y^2 + 8y + 16) = 8 + 1 + 16$

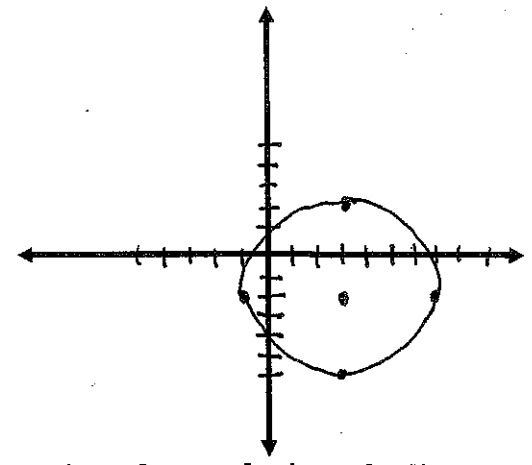
$(x-1)^2 + (y+4)^2 = 25$



7b)  $x^2 + y^2 - 6x + 4y - 3 = 0$

$(x^2 - 6x + 9) + (y^2 + 4y + 4) = 3 + 9 + 4$

$(x-3)^2 + (y+2)^2 = 16$



8) Give the equation of the circle whose center is (5, -3) and goes through (2, 5)

$(x-5)^2 + (y+3)^2 = 73$

$d = \sqrt{(5-2)^2 + (-3-5)^2}$

$d = \sqrt{9 + 64}$

$d = \sqrt{73}$

10) Give the equation of the circle whose center is (4, -3) and goes through (1, 5)

$(x-4)^2 + (y+3)^2 = 63$

$d = \sqrt{(4-1)^2 + (-3-5)^2}$

$d = \sqrt{9 + 64}$

$d = \sqrt{63}$

$r^2 = 63$

9) Give the equation whose endpoints of a diameter at (-4, 1) and (4, -5)

Center  $M = (\frac{-4+4}{2}, \frac{1-5}{2}) = (0, -2)$

$d = \sqrt{(0-(-4))^2 + (-2-1)^2}$

$= \sqrt{16 + 9}$

$= \sqrt{25}$

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

11) Give the equation whose endpoints of a diameter at (-3, 2) and (1, -5)

Center  $M = (\frac{-3+1}{2}, \frac{2-5}{2}) = (-1, -\frac{3}{2})$

$d = \sqrt{(1-(-3))^2 + (-5-2)^2}$

$d = \sqrt{4 + 49}$

$d = \sqrt{53}$

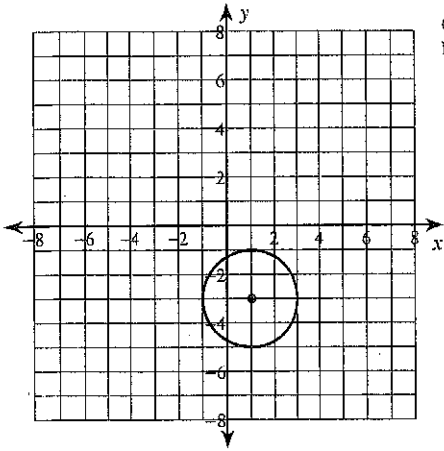
$(x+1)^2 + (y+\frac{3}{2})^2 = 53$

# Equations of Circles

Date \_\_\_\_\_ Period \_\_\_\_\_

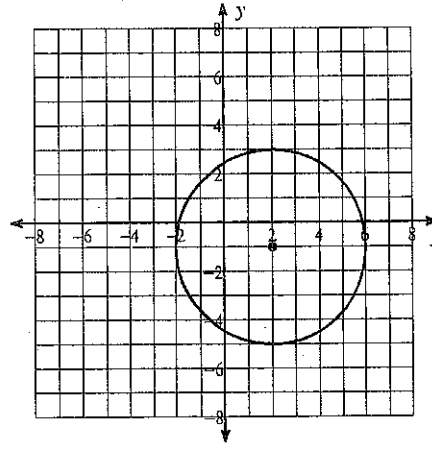
Identify the center and radius of each. Then sketch the graph.

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



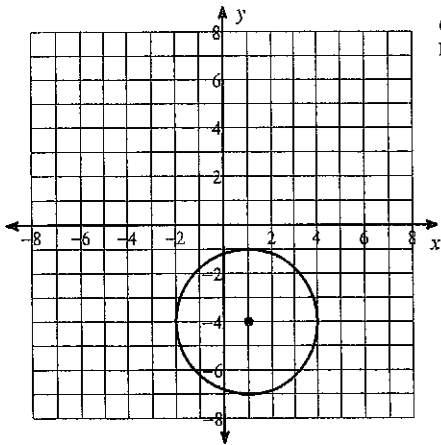
Center: (1, -3)  
Radius: 2

2)  $(x - 2)^2 + (y + 1)^2 = 16$



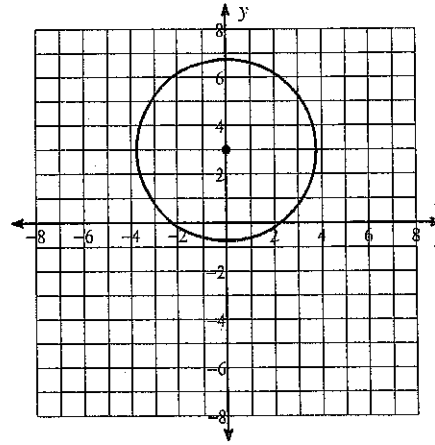
Center: (2, -1)  
Radius: 4

3)  $(x - 1)^2 + (y + 4)^2 = 9$



Center: (1, -4)  
Radius: 3

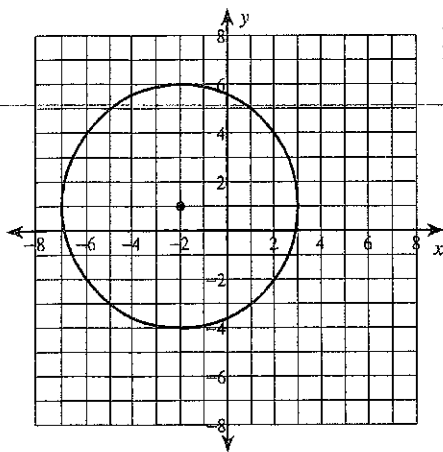
4)  $x^2 + (y - 3)^2 = 14$



Center: (0, 3)  
Radius:  $\sqrt{14}$

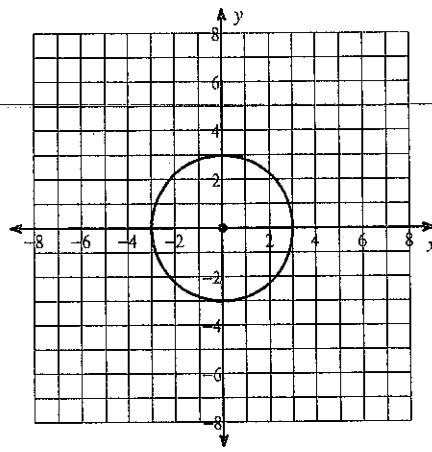


5)  $y^2 + 4x - 20 - 2y = -x^2$



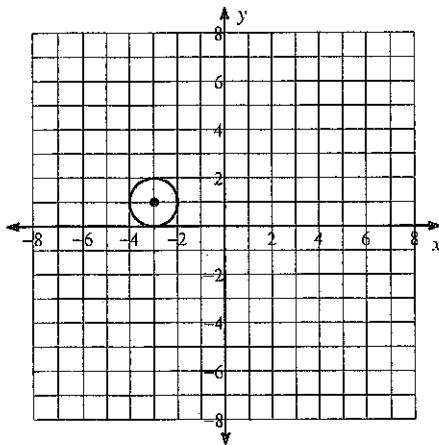
Center:  $(-2, 1)$   
Radius: 5

6)  $-y = -y - x$



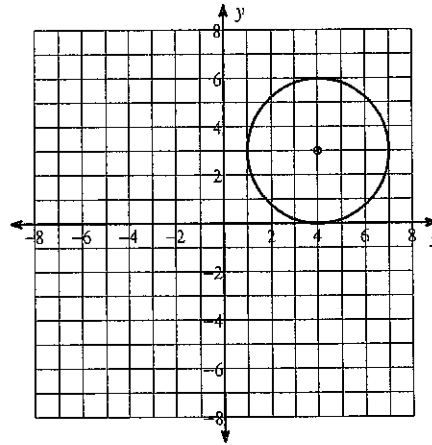
Center:  $(0, 0)$   
Radius: 3

7)  $9 = 2y - y^2 - 6x - x^2$



Center:  $(-3, 1)$   
Radius: 1

8)  $16 + x^2 + y^2 - 8x - 6y = 0$



Center:  $(4, 3)$   
Radius: 3

Use the information provided to write the equation of each circle.

- 9) Center:  $(13, -13)$   
Radius: 4

$$(x - 13)^2 + (y + 13)^2 = 16$$

- 10) Center:  $(-13, -16)$   
Point on Circle:  $(-10, -16)$

$$(x + 13)^2 + (y + 16)^2 = 9$$

- 11) Ends of a diameter:  $(18, -13)$  and  $(4, -3)$

$$(x - 11)^2 + (y + 8)^2 = 74$$

- 12) Center:  $(10, -14)$   
Tangent to  $x = 13$

$$(x - 10)^2 + (y + 14)^2 = 9$$

- 13) Center lies in the first quadrant  
Tangent to  $x = 8$ ,  $y = 3$ , and  $x = 14$

$$(x - 11)^2 + (y - 6)^2 = 9$$

- 14) Center:  $(0, 13)$   
Area:  $25\pi$

$$x^2 + (y - 13)^2 = 25$$

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# Graphing and Properties of Circles

Date \_\_\_\_\_ Period \_\_\_\_\_

Identify the center and radius of each.

1)  $x^2 + y^2 = 49$

Center: (0, 0)  
Radius: 7

2)  $x^2 + y^2 = 324$

Center: (0, 0)  
Radius: 18

3)  $(x+2)^2 + (y-3)^2 = 183$

Center: (-2, 3)  
Radius:  $\sqrt{183}$

4)  $(x+7)^2 + (y+8)^2 = 64$

Center: (-7, -8)  
Radius: 8

5)  $(x+10)^2 + (y+9)^2 = 36$

Center: (-10, -9)  
Radius: 6

6)  $(x+5)^2 + (y-10)^2 = 9$

Center: (-5, 10)  
Radius: 3

7)  $x^2 + (y+2)^2 = 121$

Center: (0, -2)  
Radius: 11

8)  $(x-14)^2 + (y-2)^2 = 4$

Center: (14, 2)  
Radius: 2

9)  $364 + 28y + y^2 + x^2 = -26x$

Center: (-13, -14)  
Radius: 1

10)  $x^2 + y^2 + 24x + 10y + 160 = 0$

Center: (-12, -5)  
Radius: 3

11)  $-6x = -x^2 + 32y - 264 - y^2$

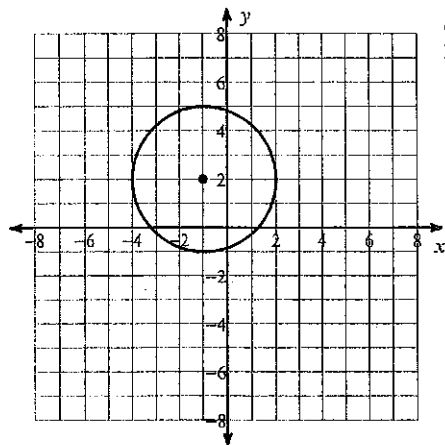
Center: (3, 16)  
Radius: 1

12)  $-6x + x^2 = 97 + 10y - y^2$

Center: (3, 5)  
Radius:  $\sqrt{131}$

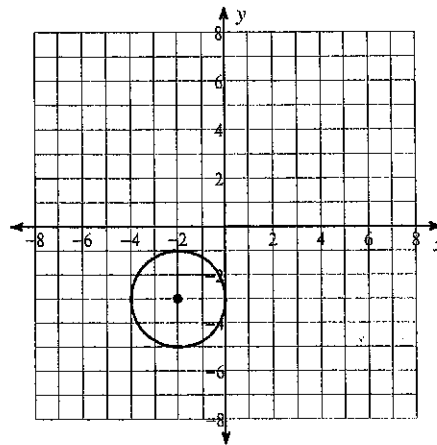
Identify the center and radius of each. Then sketch the graph.

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



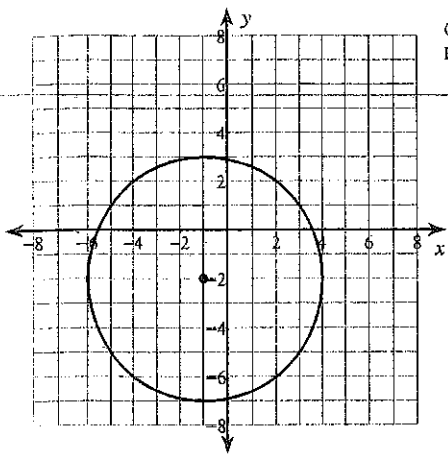
Center: (-1, 2)  
Radius: 3

14)  $(x+2)^2 + (y+3)^2 = 4$



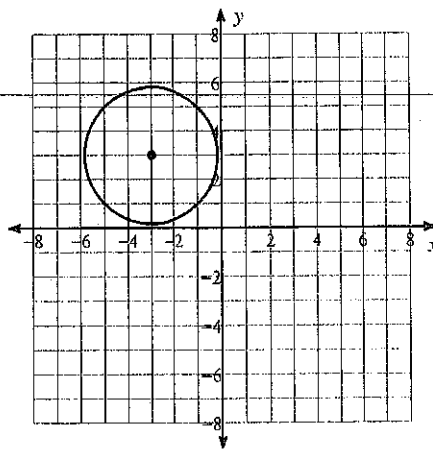
Center: (-2, -3)  
Radius: 2

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



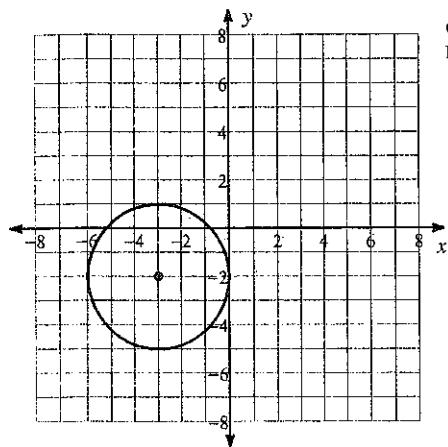
Center:  $(-1, -2)$   
Radius: 5

16)  $(x+3)^2 + (y-3)^2 = 8$



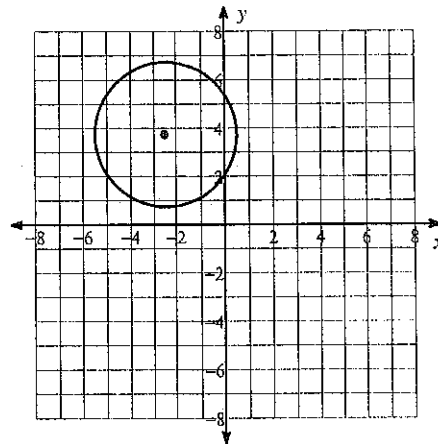
Center:  $(-3, 3)$   
Radius:  $2\sqrt{2}$

17)  $(x+3)^2 + (y+2)^2 = 9$



Center:  $(-3, -2)$   
Radius: 3

18)  $\left(x + \frac{5}{2}\right)^2 + (y - \sqrt{14})^2 = 9$



Center:  $\left(-\frac{5}{2}, \sqrt{14}\right)$   
Radius: 3

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