

## Geometry

**NOTES**

Name \_\_\_\_\_

Period \_\_\_\_\_

**DISTANCE FORMULA:**

#1 Find the distance between (8,-5) and (3,7)

#2 Find the distance between  $\left(\frac{2}{3}, \frac{3}{5}\right)$  and  $\left(-\frac{1}{3}, \frac{9}{5}\right)$ 

#3 The distance between (8,-2) and (2, x) is 10. Find x

#4 A triangle has vertices at (4, 1) (1, -2) and (6, -4). What kind of triangle is it?

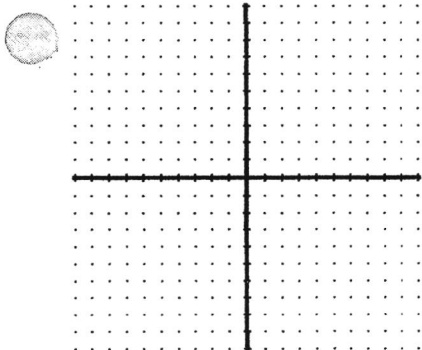
**MIDPOINT FORMULA:**

#5 What is the midpoint of the points (19,2) and (-3, 8)

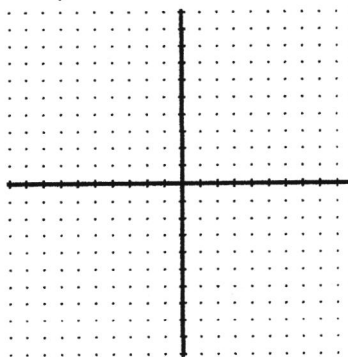
#6 The midpoint of the points (A,B) and (9, -12) is (6, 4). Find (A,B)

#7 Write the equation of the perpendicular bisector of the segment between (1,0) and (9, 6).

#8 Graph a circle centered at (3,2) with a radius of 7

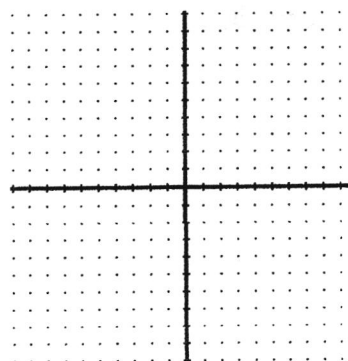


#9 Graph the circle  $x^2 + y^2 = 36$

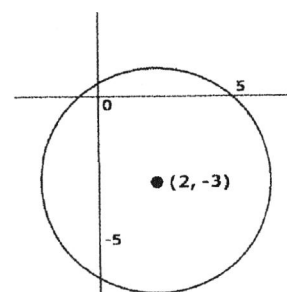
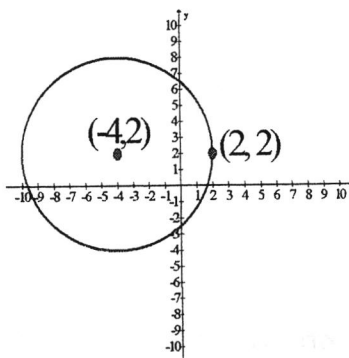
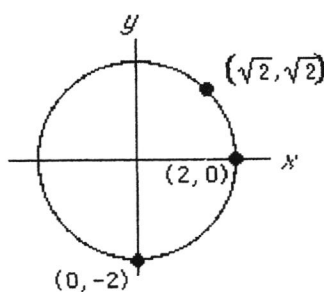
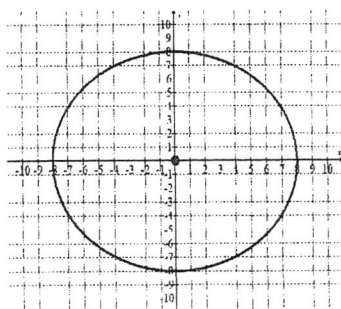


#10 Sketch the graph of the circle  $x^2 + y^2 = 16$  (label the x and y intercepts)

#11 Graph the circle  $(x - 4)^2 + (y + 2)^2 = 25$



#12 Write the equation for each of the following circles:



#13 Write the equation of the circle centered at (2, 8) passing through (5, 12)

#14 Write the equation of a circle centered at  $(-5, 4)$  with a radius of 9.

#15 Write the equation of the line tangent to the circle  $x^2 + y^2 = 10$  at the point  $(6, 8)$

#16 Sketch the following circle, label all the X and Y intercepts  $2x^2 + 2y^2 = 20$

#17 Write the equation of the line tangent to the circle at the given point:  $x^2 + y^2 = 25$ ,  $(3, 4)$

#18 Write the equation of the line tangent to the circle at the given point:  $x^2 + y^2 = 53$ ,  $(-2, -7)$

**Practice B**

For use with pages 589–594

Find the distance between the two points. Then find the midpoint of the line segment joining the two points.

1.  $(4, -3), (6, 2)$
2.  $(-2, -5), (4, 6)$
3.  $(-5, 0), (-2, -2)$
4.  $(6, 1), (2, -5)$
5.  $(2.5, -1), (-1.7, 7)$
6.  $(\frac{2}{3}, 6), (-\frac{1}{3}, 2)$

The vertices of a triangle are given. Classify the triangle as *scalene*, *isosceles*, or *equilateral*.

7.  $(-1, 3), (6, 1), (2, -5)$
8.  $(9, -2), (3, 6), (-3, -2)$
9.  $(8, 5), (1, -2), (-3, 2)$

Write an equation for the perpendicular bisector of the line segment joining the two points.

10.  $(9, -2), (-3, 2)$
11.  $(2, 5), (-1, 7)$
12.  $(0, 6), (2, 4)$

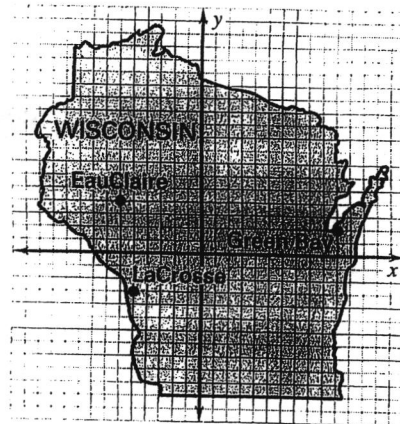
Use the given distance  $d$  between the two points to solve for  $x$ .

13.  $(-3, 2), (-10, x); d = \sqrt{53}$
14.  $(3, x), (5, 7); d = 2\sqrt{17}$

**Wisconsin** In Exercises 15–18, use the following information.

A coordinate plane is placed over the map of Wisconsin shown at the right. Each unit represents 10.5 miles.

15. Approximate the distance in miles between LaCrosse and Green Bay.
16. How long would a flight from LaCrosse to Green Bay take traveling at 225 miles per hour?
17. Approximate the distance in miles between EauClaire and LaCrosse.
18. What is the minimum time necessary to walk from EauClaire to LaCrosse walking at a rate of five miles per hour?



# CIRCLES

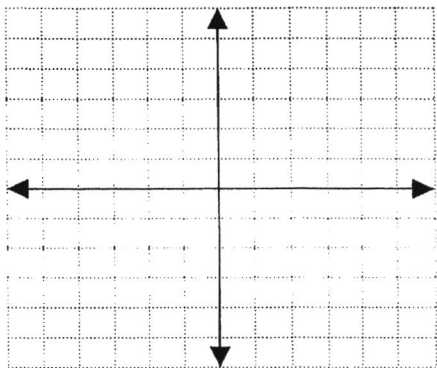
Remember... **circumference (perimeter) =  $d\pi$**  and **area =  $\pi r^2$**

The standard form of the equation of a circle with the center at (0, 0) and radius r, is...

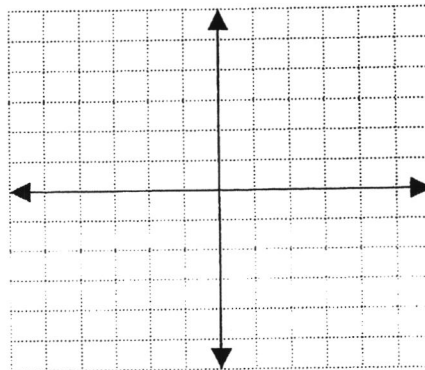
$$x^2 + y^2 = r^2$$

1. graph  $x^2 + y^2 = 25$

*Label the intercepts.*

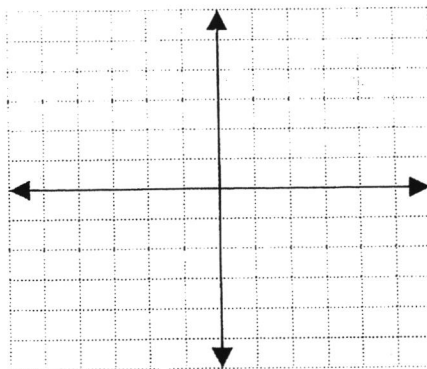


2. graph  $(x-2)^2 + (y+1)^2 = 10$



3. graph  $36x^2 + 36y^2 = 144$

*Label the intercepts.*



4. Write the equation of a circle that has a center of (0, 0) and a radius of 10.

5. Write the equation of a circle that has a center of (8, -4) and a radius of  $\sqrt{6}$ .

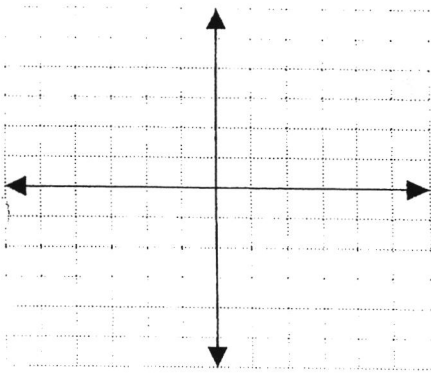
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6. Write the equation of a circle that has a center of  $(0, 0)$  and passes through  $(-2, 5)$

7. Write the equation of a circle that has a center of  $(7, -2)$  and passes through  $(1, -8)$

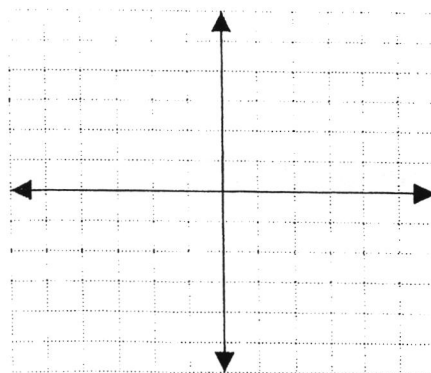
8. The equation of a circle and a point on the circle is given. Write an equation of the line that is tangent to the circle at that point.

$$x^2 + y^2 = 13 \text{ at } (2, 3)$$



9. The equation of a circle and a point on the circle is given. Write an equation of the line that is tangent to the circle at that point.

$$x^2 + y^2 = 17 \text{ at } (1, 4)$$



Find the distance between point  $C(-3, -2)$  and point  $F(5, 8)$ , then find the midpoint of  $\overline{CF}$ .

[1] \_\_\_\_\_

2. Find the distance between point  $A(3, 3)$  and point  $C(4, 8)$ , then find the midpoint of  $\overline{AC}$ .

[2] \_\_\_\_\_

[A] distance =  $\sqrt{170}$   
 midpoint =  $\left(-\frac{1}{2}, -\frac{5}{2}\right)$

[B] distance =  $\sqrt{26}$   
 midpoint =  $\left(\frac{7}{2}, \frac{11}{2}\right)$

[C] distance =  $\sqrt{170}$   
 midpoint =  $\left(\frac{7}{2}, \frac{11}{2}\right)$

[D] distance =  $\sqrt{26}$   
 midpoint =  $\left(-\frac{1}{2}, -\frac{5}{2}\right)$

3. A highway map of Ohio has a coordinate grid superimposed on top of the state. Springfield is at point  $(-3, -2)$  and Cleveland is at point  $(6, 3)$ . The Springfield History Club is going to Cleveland to see the Rock and Roll Hall of Fame. The map shows a highway rest area halfway between the cities. What are the coordinates of the rest area? What is the distance between Springfield and Cleveland? (one unit = 15.54 miles)

[A] rest area =  $\left(\frac{9}{2}, \frac{5}{2}\right)$   
 Cleveland = 44 miles

[C] rest area =  $\left(-\frac{9}{2}, -\frac{5}{2}\right)$   
 Cleveland = 49 miles

[B] rest area =  $\left(\frac{1}{2}, \frac{3}{2}\right)$   
 Cleveland = 116 miles

[D] rest area =  $\left(\frac{3}{2}, \frac{1}{2}\right)$   
 Cleveland = 160 miles

[3] \_\_\_\_\_

4. The vertices of a triangle are given. Classify the triangle as scalene, isosceles, or equilateral.

$X(-2, 0)$ ,  $Y(2, 0)$  and  $Z(0, 2\sqrt{3})$

[4] \_\_\_\_\_

5. Use the given distance  $d$  between the two points to solve for  $x$ .

a)  $(-3, 2), (-10, x)$ ;  $d = \sqrt{53}$

b)  $(3, x), (5, 7)$ ;  $d = 2\sqrt{17}$

[5] \_\_\_\_\_

6. Write an equation for the perpendicular bisector joining the following segments.

a)  $(4, -6)$  and  $(-2, 4)$

b)  $(2, 5)$  and  $(-1, 7)$

[6] \_\_\_\_\_

7. Write the standard form of the equation of the circle with radius 7 and center at  $(0, 0)$ .

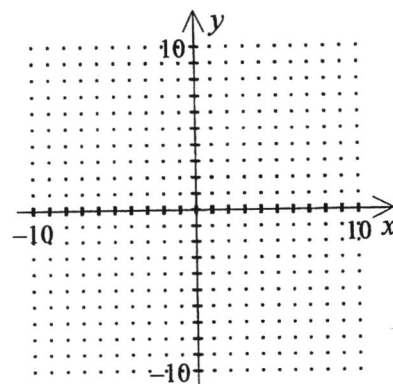
[7] \_\_\_\_\_



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8.  $3x^2 + 3y^2 = 75$

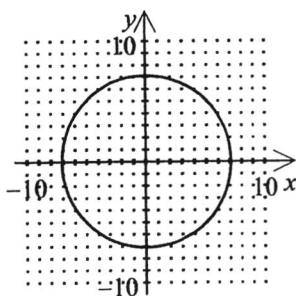


[8] \_\_\_\_\_

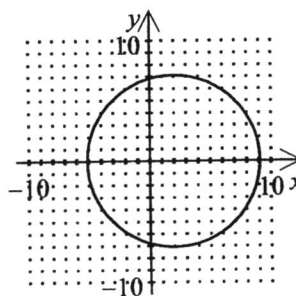
9.  $3x^2 + 3y^2 = 75$

[9] \_\_\_\_\_

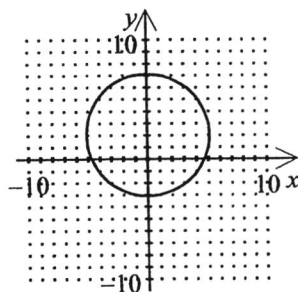
[A]



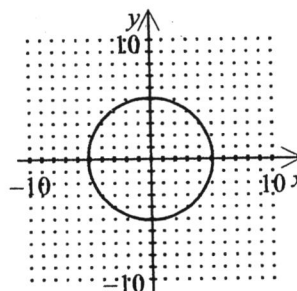
[B]



[C]



[D]



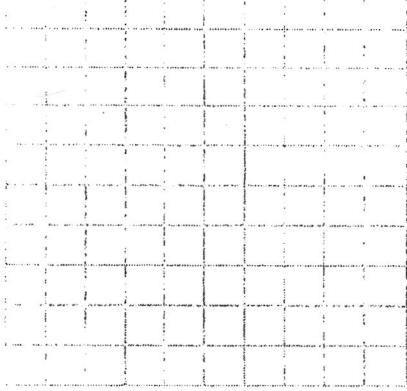
10. Write the standard form of the equation of the circle that passes through the point (0, 1) with its center at the origin.

[10] \_\_\_\_\_

11. Write the standard form of the equation of the circle that passes through the point (3, 4) with its center at the origin.

[11] \_\_\_\_\_

12. Sketch the graph of  $x^2 + y^2 = 15$ .



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[12] \_\_\_\_\_

13. Write an equation of the line that is tangent to the given circle at the given point

a)  $x^2 + y^2 = 25$ ; (3, -4)

b)  $x^2 + y^2 = 20$ ; (4, 2)

[13] \_\_\_\_\_