

Find the center and radius of the circle.

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

$(0,0)$   $r=6$

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

$(2,7)$   $r=7$

3.  $(x + 1)^2 + (y + 6)^2 = 16$

$(-1,-6)$   $r=4$

4.  $(x + 3)^2 + (y - 11)^2 = 12$

$(-3,11)$   $r=\sqrt{12} \approx 3.5$

Write the standard equation of each circle.

5. center  $(0,0)$ :  $r = 7$

$x^2 + y^2 = 49$

6. center  $(4,3)$ :  $r = 8$

$(x - 4)^2 + (y - 3)^2 = 64$

7. center  $(5,3)$ :  $r = 2$

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

8. center  $(-5,4)$ :  $r = \frac{1}{2}$

$(x + 5)^2 + (y - 4)^2 = \frac{1}{4}$

9. center  $(-2,-5)$ :  $r = \sqrt{2}$

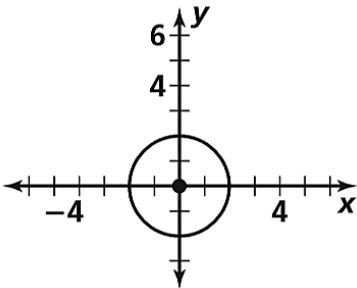
$(x + 2)^2 + (y + 5)^2 = 2$

10. center  $(-1,6)$ :  $r = \sqrt{5}$

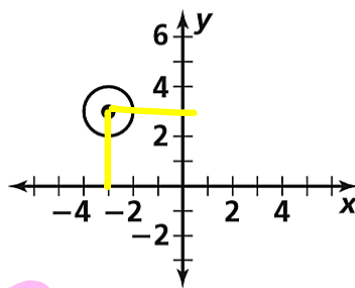
$(x + 1)^2 + (y - 6)^2 = 5$

Write an equation for each circle.

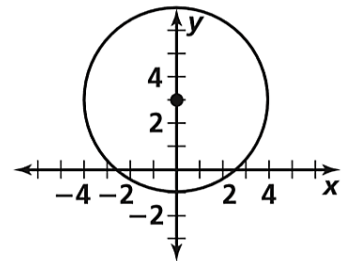
11.  $x^2 + y^2 = 4$



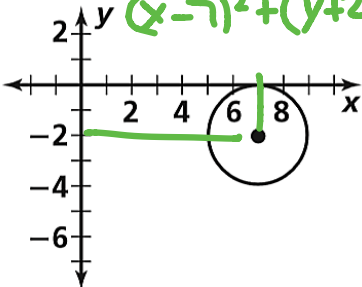
12.  $(x + 3)^2 + (y - 3)^2 = 1$



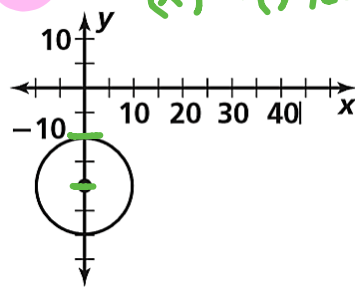
13.  $x^2 + (y - 3)^2 = 16$



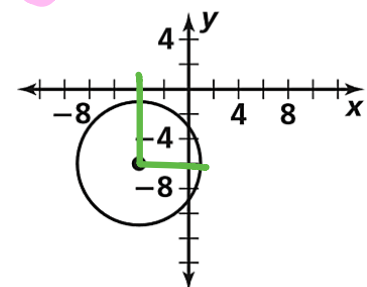
14.  $(x - 7)^2 + (y + 2)^2 = 4$



15.  $(x)^2 + (y + 20)^2 = 100$

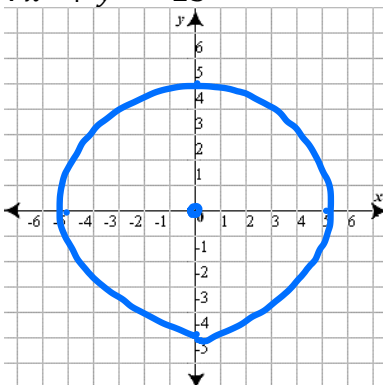


16.  $(x + 4)^2 + (y + 6)^2 = 25$

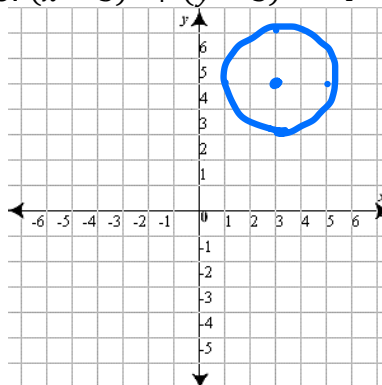


Graph each circle.

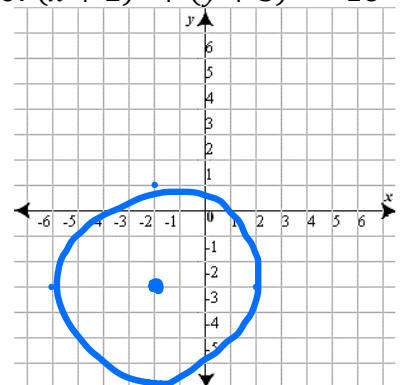
17.  $x^2 + y^2 = 25$



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



19.  $(x + 2)^2 + (y + 3)^2 = 16$



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

Write an equation for each circle with the given center that passes through the given point.

20. center (0,0): point (3,4)

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

$$3^2 + 4^2 = c^2$$

$$9 + 16 = c^2$$

$$\sqrt{25} = \sqrt{c^2}$$

$$c = 5$$

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

21. center (5,9): point (2,9)

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

$$3^2 + 0^2 = c^2$$

$$\sqrt{9} = \sqrt{c^2}$$

$$c = 3$$

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

Rewrite the equation from general form to standard form.

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

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

$$x^2 + x + x + 1 + y^2 - 2y - 2y + 4 = 9$$

$$x^2 + y^2 + 2x - 4y - 4 = 0$$

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

Find in each case whether the given point lies inside, outside or on the given circle.

24. (0, -9)  $x^2 + y^2 = 64$

$$0^2 + (-9)^2 = 64$$

$$81 \neq 64$$

Outside

25. (4, 7)  $x^2 + y^2 - 2x - 6y - 26 = 0$

$$4^2 + 7^2 - 2(4) - 6(7) - 26 = 0$$

$$-11 = 0$$

inside

26. (7, -3)  $x^2 + y^2 + 10x - 4y = 140$

$$140 = 140$$

On

27. (-4, 1)  $(x+1)^2 + (y+4)^2 = 30$

$$34 \neq 30$$

Outside

28. (4, 1)  $(x-2)^2 + (y+6)^2 = 29$

$$53 \neq 29$$

Outside

29. Determine whether each point is on, inside, or outside the circle  $x^2 + y^2 = 34$ .

A. (-6, 0)

$$36 \neq 34$$

outside

B. (-3, -5)

$$34 = 34$$

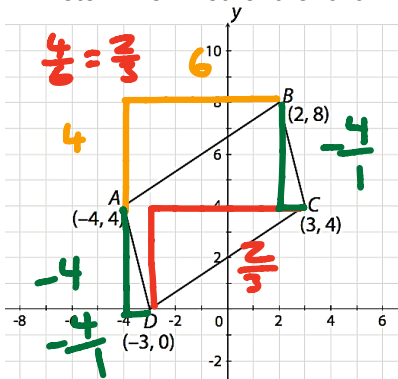
On

C. (2, -6)

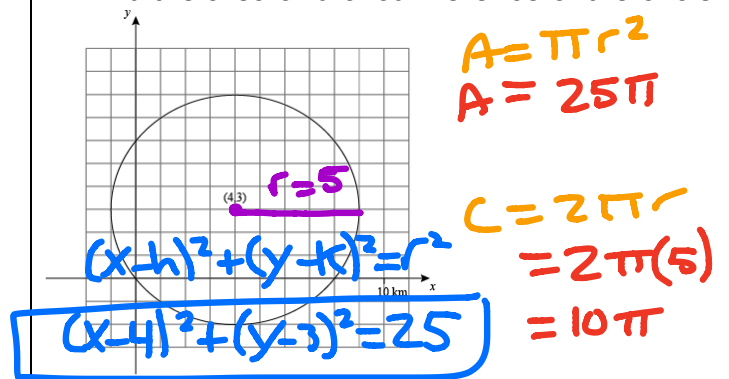
$$40 \neq 34$$

outside

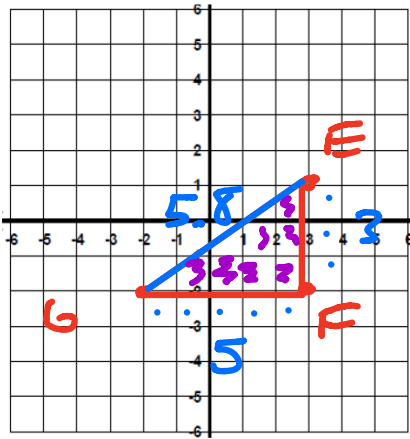
1. Determine whether the following is a parallelogram.



2. Find the area and circumference of the circle.



3. Find the area of the polygon with the given vertices. E(3, 1), F(3, -2), G(-2, -2).



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

$$3^2 + 5^2 = c^2$$

$$9 + 25 = c^2$$

$$\sqrt{34} = c^2$$

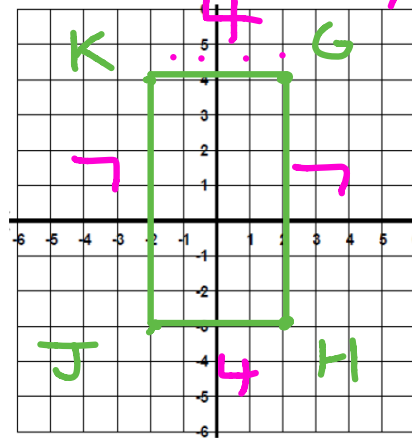
$$c = 5.8$$

$$A = \frac{1}{2}bh$$

$$= \frac{1}{2}(5)(3)$$

$$= 7.5$$

4. Find the perimeter of the polygon with the given vertices. G(2, 4), H(2, -3), J(-2, -3), K(-2, 4).



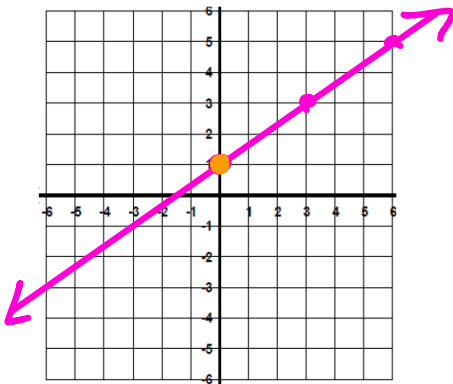
$$P = 4 + 7 + 4 + 7$$

$$= 22$$

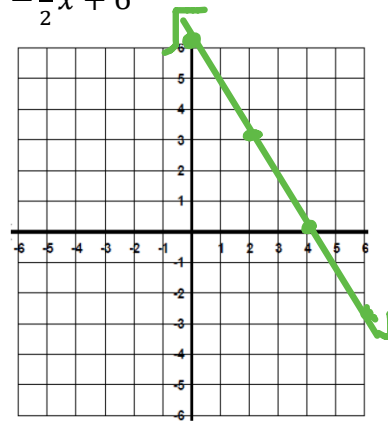
Graph the linear equations and determine which equations are parallel and which are perpendicular.

A.  $y = \frac{2}{3}x + 1$

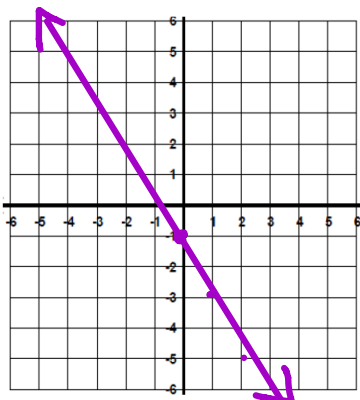
$y = mx + b$



B.  $y = -\frac{3}{2}x + 6$

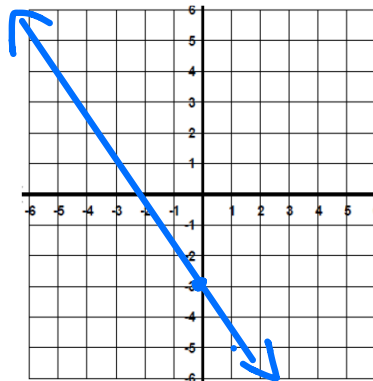


C.  $y = -2x - 1$



C // D  
A ⊥ B

D.  $y = -2x - 3$



Write the slope intercept form of the equation of the line described.

<p>1. through: <math>(2,2)</math>, parallel to <math>y = x + 4</math> <math>m=1</math></p> <p><math>y - y_1 = m(x - x_1)</math>  <math>y - 2 = 1(x - 2)</math>  <math>y - 2 = x - 2</math>  <math>+2 \quad +2</math>  <math>y = x</math></p>	<p>2. through: <math>(4,3)</math>, parallel to <math>y = 3x + 2</math></p> <p><math>y - y_1 = m(x - x_1)</math>  <math>y - 3 = 3(x - 4)</math>  <math>y - 3 = 3x - 12</math>  <math>y = 3x - 9</math></p>
<p>3. through: <math>(2, -1)</math>, parallel to <math>y = -\frac{2}{5}x + 3</math></p> <p><math>y - y_1 = m(x - x_1)</math>  <math>y - (-1) = -\frac{2}{5}(x - 2)</math>  <math>y + 1 = -\frac{2}{5}x + \frac{4}{5}</math>  <math>y = -\frac{2}{5}x - \frac{1}{5}</math></p>	<p>4. through: <math>(1, -5)</math>, perpendicular to <math>y = \frac{1}{8}x + 2</math> <math>m = -8</math></p> <p><math>y - y_1 = m(x - x_1)</math>  <math>y - (-5) = -8(x - 1)</math>  <math>y + 5 = -8x + 8</math>  <math>y + 5 = -8x + 8</math>  <math>-5 \quad -5</math>  <math>y = -8x + 3</math></p>
<p>5. through: <math>(4, -1)</math>, perpendicular to <math>y = x + 2</math></p> <p><math>y - (-1) = -1(x - 4)</math>  <math>y + 1 = -x + 4</math>  <math>y = -x + 3</math></p>	<p>6. through: <math>(3,4)</math>, perpendicular to <math>y = -2x - 4</math></p> <p><math>y - y_1 = m(x - x_1)</math>  <math>y - 4 = \frac{1}{2}(x - 3)</math>  <math>y - 4 = \frac{1}{2}x - \frac{3}{2}</math>  <math>+4 \quad +4</math>  <math>y = \frac{1}{2}x + \frac{5}{2}</math></p>
<p>7. Determine which of the lines, if any, are parallel. Explain.</p> <p>Line a: <math>y = -x + 4</math></p> <p>Line b: <math>y = x - 7</math></p> <p>Line c: <math>5y = -5x + 10</math>  <math>y = -x + 2</math></p> <p style="text-align: center;">A//C</p>	<p>8. Determine which of the lines, if any, are perpendicular. Explain.</p> <p>Line a: <math>y = -4x + 1</math></p> <p>Line b: <math>y = -\frac{1}{4}x - 1</math></p> <p>Line c: <math>y = \frac{1}{4}x + 3</math></p> <p style="text-align: center;">A ⊥ C</p>

## Partitioning Segments

<p><b>Coordinates of point which partitions a directed line segment AB at the ratio of <math>a:b</math> from <math>A(x_1, y_1)</math> to <math>B(x_2, y_2)</math></b></p> <p><math>(x, y) = \left( \frac{bx_1 + ax_2}{b+a}, \frac{by_1 + ay_2}{b+a} \right)</math></p> <p>OR</p> <p><math>(x, y) = \left( x_1 + \frac{a}{a+b}(x_2 - x_1), y_1 + \frac{a}{a+b}(y_2 - y_1) \right)</math></p>	<p>1. Find the coordinates of the point P that lies along the directed segment from M (-5, -2) to N (-5, 8) and partitions the segment in the ratio of 4:6.</p> <p><math>x_1 = -5</math>      <math>a = 4</math>  <math>y_1 = -2</math>      <math>b = 6</math>  <math>x_2 = -5</math>      <math>(-5, 2)</math>  <math>y_2 = 8</math></p>
<p>2. Find the coordinates of the point R that lies along the directed segment from J (10, -5) to K (-2, -3) and partitions the segment in the ratio of 2:7.</p> <p><math>x_1 = 10</math>      <math>a = 2</math>  <math>y_1 = -5</math>      <math>b = 7</math>  <math>x_2 = -2</math>  <math>y_2 = -3</math></p> <p><math>\left( \frac{22}{3}, -\frac{41}{9} \right)</math>  <math>(7.\bar{3}, -4.\bar{5})</math></p>	<p>3. Find the coordinates of point Q that is <math>\frac{2}{3}</math> of the way along the directed segment from R (-7, -2) to S (2, 4).</p>

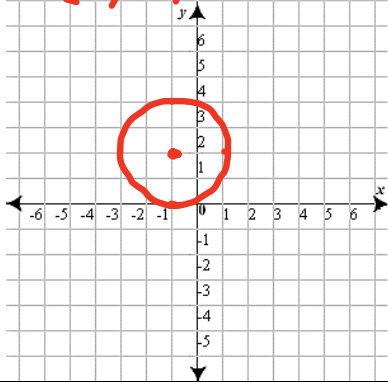
## Coordinate Geometry Review

<p>1. What is the distance between the points (-6, 5) and (1, 1)?</p> <p><math>a^2 + b^2 = c^2</math>  <math>7^2 + 4^2 = c^2</math>  <math>\sqrt{65} = \sqrt{c^2}</math>      <math>c = 8.1</math></p>	<p>2. What is the midpoint between (-2, 5) and (4, 8)?</p> <p><math>\frac{-2+4}{2}</math>      <math>\frac{5+8}{2}</math>  <math>(1, 6.5)</math></p>
<p>3. One endpoint of a segment is (20, 20). The midpoint of the segment is (-2, 4). What is the second endpoint of this segment?</p> <p><math>(20, 20)</math>  <math>(-2, 4)</math>  <math>(-24, -12)</math></p>	<p>4. What is the point that is 2:1 the distance from the endpoint (-3, 8) of the segment with endpoints (-3, 8) and (9, -7)?</p> <p><math>(5, -2)</math></p>
<p>5. What is the equation of a circle with center (-2, 5) and radius 4?</p> <p><math>(x+2)^2 + (y-5)^2 = 16</math></p>	<p>6. What is the equation of the circle that has a center (0, 2) and passes through (2, -3)?</p> <p><math>a^2 + b^2 = c^2</math>  <math>2^2 + 5^2 = c^2</math>  <math>c = \sqrt{29}</math></p> <p><math>(x-0)^2 + (y-2)^2 = 29</math></p>
<p>7. Determine whether the points are inside, outside, or on the given circle. <math>(x-2)^2 + (y+1)^2 = 36</math></p> <p>A. (2, 5) <math>36 = 36</math> on          B. (0, -4) <math>13 \neq 36</math> inside          C. (-4, 2) <math>45 \neq 36</math> outside</p>	<p>8. Put the equation of the circle in general form: <math>(x-2)^2 + (y+2)^2 = 36</math></p> <p><math>(x-2)(x-2) + (y+2)(y+2) = 36</math>  <math>x^2 - 4x + 4 + y^2 + 4y + 4 = 36</math>  <math>-36</math>      <math>-36</math></p> <p><math>x^2 + y^2 - 4x + 4y - 24 = 0</math></p>

Graph the following circles, State the center and radius.

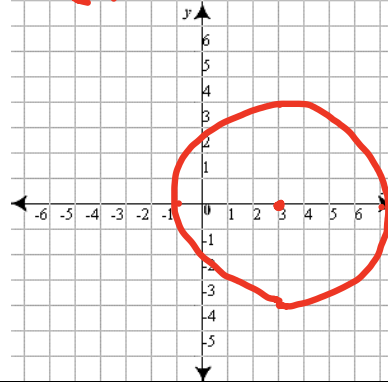
9.  $(x + 1)^2 + (y - 2)^2 = 4$

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



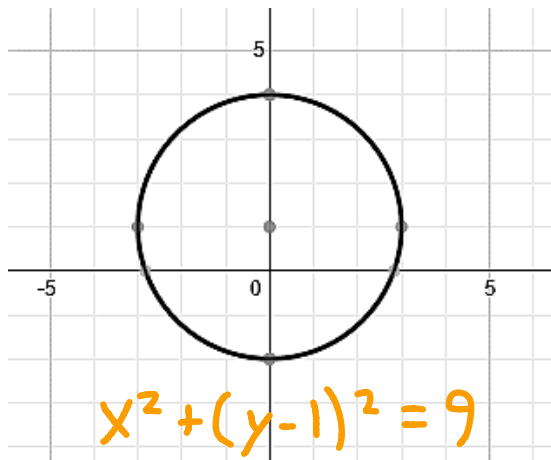
10.  $(x - 3)^2 + y^2 = 16$

Center:  $(3, 0)$  Radius:  $4$

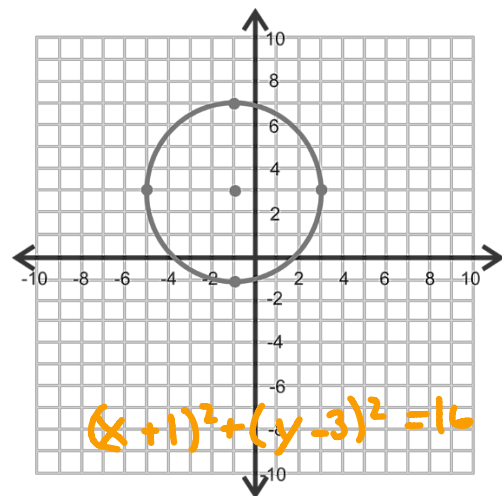


Write the equation of the circle given the graph.

11.



12.



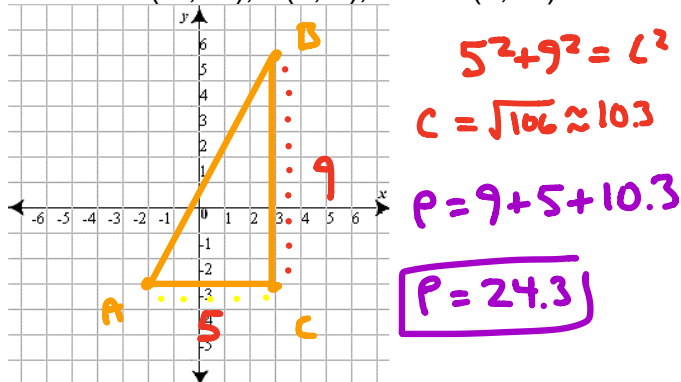
13. Write an equation that represents a line that is parallel to the line  $y = \frac{4}{3}x + 3$  and passes through the point  $(3, 5)$ .

$y - 5 = \frac{4}{3}(x - 3)$   
 $y - 5 = \frac{4}{3}x - 4$   
 $y = \frac{4}{3}x + 1$

14. Write an equation that represents a line that is perpendicular to the line  $y = 2x + 3$  and passes through the point  $(8, 0)$ .

$y - 0 = -\frac{1}{2}(x - 8)$   
 $y = -\frac{1}{2}x + 4$

15. What is the perimeter of triangle ABC with vertices  $A(-2, -3)$ ,  $B(3, 6)$ , and  $C(3, -3)$ ?



16. What is the area of the rectangle ABCD with vertices  $A(-5, 2)$ ,  $B(-4, 5)$ ,  $C(2, 3)$ , and  $D(1, 0)$ ?

