

## 5-REVIEW Part 1

Name: \_\_\_\_\_

- 1.) What formula is used to find each of the following?

The length of a line segment distance  $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Point in a 2:1 ratio between points Partitioning  $\left( \frac{bx_1 + ax_2}{b+a}, \frac{by_1 + ay_2}{b+a} \right)$

The point in the middle of two points Midpoint  $\left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$

The slope of a line between two points Slope  $m = \frac{y_2 - y_1}{x_2 - x_1}$

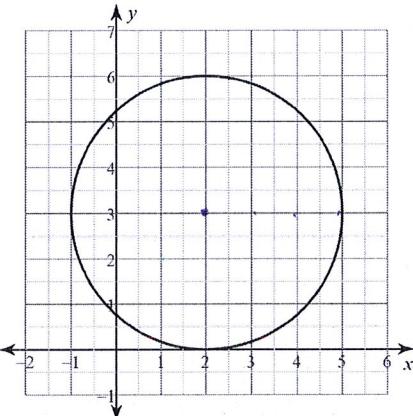
- 2.) Identify the center and the radius of the circle.

Center  $(2, 3)$

$r = 3$

- 3.) Write the equation of the circle.

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



- 4.) What is the equation of the circle in standard form:

$$x^2 + y^2 + 18x - 24y + 189 = 0$$

$$x^2 + 18x + 81 + y^2 - 24y + 144 = -189 + 181 + 144$$

$$(x + 9)^2 + (y - 12)^2 = 36$$

Equation \_\_\_\_\_

Center  $(-9, 12)$

$r = \sqrt{36} = 6$

- 5.) Find the distance between the pair of points:  $(-3, 2)$  and  $(2, -1)$ . (leave in radical form)

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

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

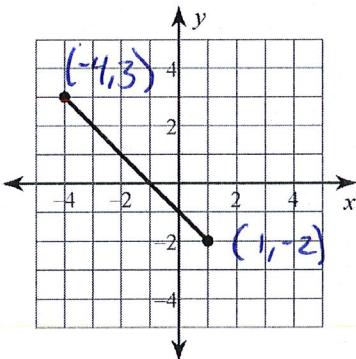
$$d = \sqrt{25 + 9} = \boxed{\sqrt{34}}$$

- 6.) Find the slope between the pair of points:  $(10, -1)$  and  $(-12, -13)$ .

$$m = \frac{-13 - (-1)}{-12 - 10} = \frac{-12}{-22} = \boxed{\frac{6}{11}}$$

- 7.) Find the midpoint of the segment shown.

$$\begin{aligned} & \left( \frac{-4+1}{2}, \frac{3+(-2)}{2} \right) \\ &= \left( \frac{3}{2}, \frac{1}{2} \right) \text{ or } (-1.5, 0.5) \end{aligned}$$



8.) What are 2 appropriate ways to prove a parallelogram is a rectangle?

Sides perpendicular and diagonals congruent

What are 2 ways to prove a quadrilateral is a parallelogram?

Sides parallel and Sides congruent

What are 2 ways to prove a triangle is a Right Triangle?

legs perpendicular and fits  $a^2 + b^2 = c^2$

9.) A segment has endpoints X(-4, -4) and Y(4, 2). Find the coordinates of point T that is  $\frac{2}{5}$  of the way from X to Y.

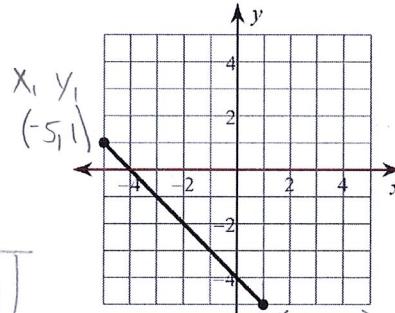
$$\left( \frac{3(-4) + 2(4)}{3+2}, \frac{3(-4) + 2(2)}{3+2} \right) \rightarrow \left( \frac{-12 + 8}{5}, \frac{-12 + 4}{5} \right) \rightarrow \boxed{\left( \frac{-4}{5}, \frac{-8}{5} \right)}$$

10.) Find the coordinates that partition the line segment in a 1:2 ratio.

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

$$\left( \frac{-10 + 1}{3}, \frac{2 - 5}{3} \right)$$

$$\left( \frac{-9}{3}, \frac{-3}{3} \right) \rightarrow \boxed{(-3, -1)}$$

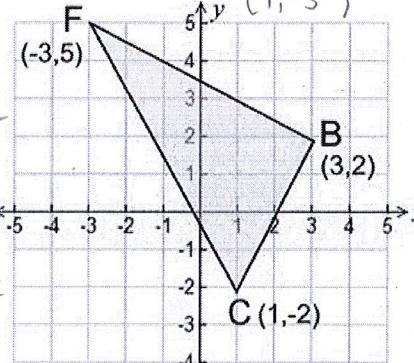


11.) Find the perimeter of the triangle FBC with vertices F(-3, 5), B(3, 2), and C(1, -2).

$$FB = \sqrt{(3 - -3)^2 + (2 - 5)^2} = \sqrt{36 + 9} = \sqrt{45}$$

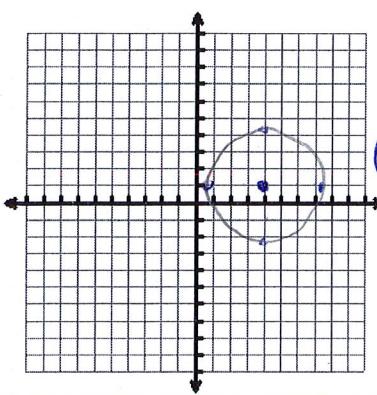
$$BC = \sqrt{(1 - 3)^2 + (-2 - 2)^2} = \sqrt{4 + 16} = \sqrt{20}$$

$$FC = \sqrt{(1 - -3)^2 + (-2 - 5)^2} = \sqrt{16 + 49} = \sqrt{65}$$



$$P = \sqrt{45} + \sqrt{20} + \sqrt{65} \approx 6.7 + 4.5 + 8.1 \approx 19.3$$

12.) Graph the circle. State the center and radius.



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

$$x^2 - 8x + 16 + y^2 - 2y + 1 = -6 + 16 + 1$$

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

$$(x - 4)^2 + (y - 1)^2 = 11$$

$$(4, 1) \quad r = \sqrt{11} \approx 3.2$$

13.) Quadrilateral ABDC has vertices A(1, 5), B(5, 8), C(11, 0), and D(7, -3).

a.) PROVE that the quadrilateral ABDC is a parallelogram.

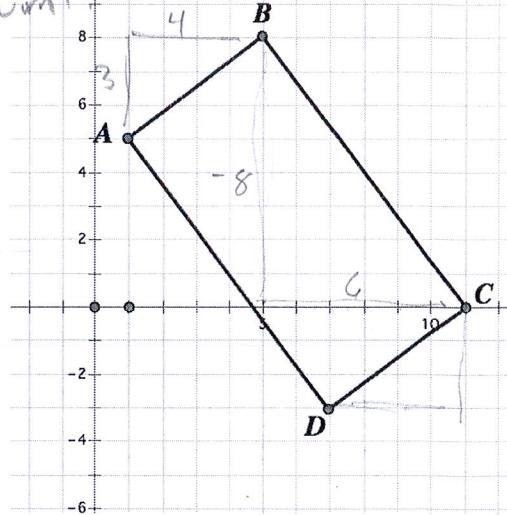
$m = \frac{y_2 - y_1}{x_2 - x_1}$  but you can maybe just count

$$\overline{AB} \ m = \frac{3}{4}$$

$$\overline{BD} \ m = -\frac{8}{6} = -\frac{4}{3}$$

$$\overline{DC} \ m = \frac{3}{4}$$

$$\overline{AC} \ m = -\frac{4}{3}$$



Therefore, ABDC is a parallelogram because:

Opp sides have the same slope  
therefore the opp sides are  $\parallel$  ← parallel

b.) PROVE that quadrilateral ABDC is a rectangle.

$$\begin{aligned}\overline{AB} \ m &= \frac{3}{4} \\ \overline{BD} \ m &= -\frac{4}{3}\end{aligned}\quad \left.\right\} \text{opposite reciprocals}$$

Therefore, ABDC is a rectangle because:

The sides are perpendicular  
therefore the corners are RT & S,

14.) Circle C has a center of  $(-3, 1)$  and a radius of 5.

Does the point  $(-7, -2)$  lie inside, outside or on circle C?

Show algebraic evidence to support your answer.

$$(x+3)^2 + (y-1)^2 = 25$$

$d =$

Plug in  $(-7, -2)$

$$(-7+3)^2 + (-2-1)^2 = 25$$

$$(-4)^2 + (-3)^2 = 25$$

$$16 + 9$$

$$25 = 25$$

Therefore, the point lies (inside / on / outside) the circle because:

B/c they're equal, the pt  $(-7, -2)$  is on the circle

$< r^2$  would mean inside

$> r^2$  would mean outside

## Unit 5 REVIEW Part 2

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

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

**Identify the CENTER of each.**CTR at  $(h, k)$ 

15)  $(x+5)^2 + (y-1)^2 = 49$

$(-5, 1)$

16)  $(x+5)^2 + (y+9)^2 = 100$

$(-5, -9)$

**Identify the RADIUS of each.**

17)  $(x-11)^2 + (y+12)^2 = 9$

$r^2 = 9 \quad \boxed{r=3}$

18)  $(x-8)^2 + (y-7)^2 = 36$

$r^2 = 36 \quad \boxed{r=6}$

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

19) Center:  $(11, -14)$

Radius: 2

$(x-11)^2 + (y+14)^2 = 4$

20) Center:  $(2, 7)$

Radius: 3

$(x-2)^2 + (y-7)^2 = 9$

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

21) through:  $(-1, 1)$ , parallel to  $y = x + 1$

- A)  $y = 2x + 2$       B)  $y = 4x + 2$   
 C)  $y = -3x + 2$       D)  $y = x + 2$

Slope has to be  $m=1$ 

22) through:  $(-2, 5)$ , parallel to  $y = -\frac{7}{2}x - 3$

- A)  $y = 2x - 2$       B)  $y = \frac{7}{2}x - 2$   
 C)  $y = -2x - 2$       D)  $y = -\frac{7}{2}x - 2$

Slope must be  $m = -\frac{7}{2}$ 

23) through:  $(3, -3)$ , parallel to  $y = -2x + 4$

$m = -2$

$$\begin{aligned} -3 &= -2(3) + b \\ -3 &= -6 + b \end{aligned}$$

$$\text{So } \boxed{y = -2x + 3}$$

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

24) through:  $(4, 0)$ , perp. to  $y = \frac{1}{2}x - 1$

- A)  $y = -2x + 8$       B)  $y = x + 8$   
 C)  $y = 8x + 1$       D)  $y = -x + 8$

Slope must be  $m = -2$ 

25) through:  $(-4, 3)$ , perp. to  $y = 4x - 2$

- A)  $y = -\frac{1}{2}x + 2$       B)  $y = -\frac{1}{4}x + 2$   
 C)  $y = 2x - \frac{1}{2}$       D)  $y = \frac{1}{4}x + 2$

Slope is  $m = -\frac{1}{4}$ 

26) through:  $(2, -1)$ , perp. to  $y = \frac{1}{6}x - 5$

$m = -6$

$$\begin{aligned} -1 &= -6(2) + b \\ -1 &= -12 + b \end{aligned}$$

$\boxed{y = -6x + 11}$