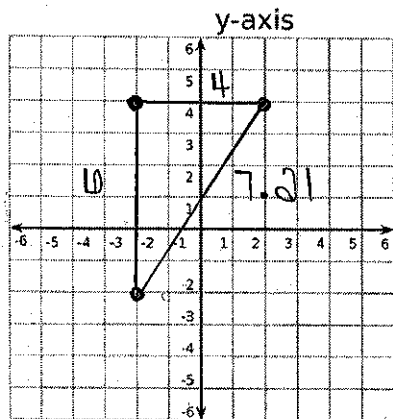


Name \_\_\_\_\_

Date \_\_\_\_\_

## Unit 5: Geometry Study Guide (SEMESTER)

1. Given a triangle with vertices:  $(-2, 4)$ ,  $(-2, -2)$  and  $(2, 4)$ , what is the approximate perimeter? (Round to the nearest hundredth)



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

$$(6)^2 + (4)^2 = c^2$$

$$36 + 16 = c^2$$

$$52 = c^2$$

$$c = 7.21$$

$$P = 17.21 \text{ units}$$

2. Janie and Michael are playing a game. Janie's piece lands at the point  $(-4, -7)$ . On the next turn, Maya's piece lands at the point  $(16, -13)$ .

A. What are the coordinates of the point midway between the two pieces?

$$\frac{-4 + 16}{2}, \frac{-7 + (-13)}{2}$$

$$\frac{12}{2}, \frac{-20}{2}$$

$$(6, -10)$$

B. How far apart are Janie and Michael's game pieces? Round to the nearest hundredth.

$$d = \sqrt{(16 + 4)^2 + (-13 + 7)^2}$$

$$d = \sqrt{400 + 36} = \sqrt{436}$$

$$d = 20.88 \text{ units}$$

3. Write the equation of a line **parallel** to  $-12x - 3y = -15$ , that passes through the point  $(2, -1)$ .

$$-12x - 3y = -15$$

$$-3y = 12x - 15$$

$$\frac{-3}{-3} \frac{12}{-3} \frac{-15}{-3}$$

$$y = -4x + 5$$

$$-1 = -4(2) + b$$

$$-1 = -8 + b$$

$$7 = b$$

$$y = -4x + 7$$

4. Write the equation of a line that is **perpendicular** to  $-3x + 4y = -20$  that passes through the point  $(9, 2)$ .

$$-3x + 4y = -20$$

$$4y = 3x - 20$$

$$y = \frac{3}{4}x - 5$$

$$2 = -\frac{4}{3}(9) + b$$

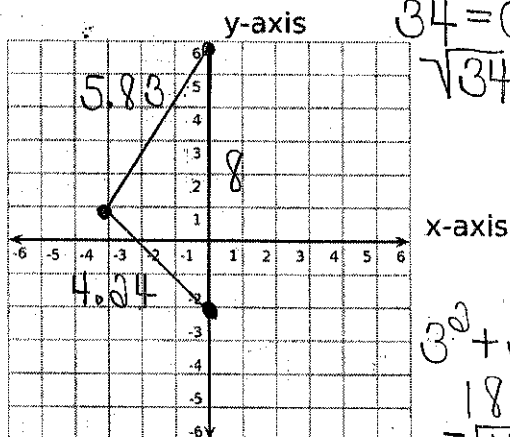
$$2 = -12 + b$$

$$14 = b$$

$$y = \frac{4}{3}x + 14$$

5. A triangle has vertices at:  $A(-3, 1)$ ,  $B(0, 6)$  and  $C(0, -2)$

A. Graph the triangle and find the lengths of all three sides.



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

$$34 = c^2$$

$$\sqrt{34} = c$$

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

$$18 = c^2$$

$$\sqrt{18} = c$$

B. **Circle** the classification that best describes this triangle:

Equilateral

Isosceles

Scalene

6. Determine if the lines are parallel, perpendicular, or neither.

$$\text{Line A: } 6x - 5y = 3$$

$$\text{Line B: } 6y - 5x = 24$$

These lines are:

- a. Parallel  
b. Perpendicular  
☒ c. Neither  
d. These are the same line.

$$6y - 5x = 24$$

$$\frac{6y}{6} = \frac{5x}{6} + \frac{24}{6}$$

$$y = \frac{5}{6}x + 4$$

$$6x - 5y = 3$$

$$\frac{-5y}{-5} = \frac{-6x}{-5} + \frac{3}{-5}$$

$$y = \frac{6}{5}x - \frac{3}{5}$$

7. Find the distance between the points given. Write your answer as a simplified radical.

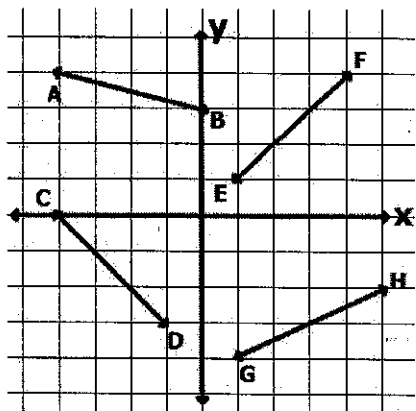
(4, 2) and (-2, 5)

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

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

$$d = \sqrt{45} = d = 3\sqrt{5}$$

9. Which two line segments are perpendicular?



11. Veronica and Sarah live in the same neighborhood. On a grid of their neighborhood, Veronica's house is located at (-10, -7) and Sarah's house is located at (-8, -1).

A. What is the distance between Veronica and Sarah's homes? Round your answer to the nearest hundredth.

$$d = \sqrt{(-8+10)^2 + (-1+7)^2}$$

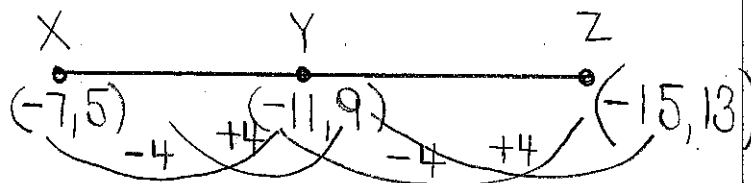
$$d = \sqrt{(2)^2 + (6)^2} \quad d = 6.32$$

B. Their friend Stephanie lives exactly halfway between their homes. What are the coordinates of Stephanie's home?

$$\frac{-10+(-8)}{2}, \frac{-1+(-7)}{2}$$

$$\frac{-18}{2}, \frac{-8}{2} \quad (-9, -4)$$

8. Y is the midpoint of XZ. If the coordinates of X are (-7, 5) and the coordinates of Y are (-11, 9), find the coordinates of Z.



10.) Write an equation in slope intercept form for the line that contains (-6, 5) and is perpendicular to the line  $3x - 4y = -8$ .

$$-3x \quad -3x$$

$$\frac{-4y}{-4} = \frac{-3x-8}{-4}$$

$$y = \frac{3}{4}x + 2$$

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

$$5 = \frac{-4}{3}(-6) + b$$

$$5 = 8 + b$$

$$-3 = b$$

$$y = \frac{-4}{3}x - 3$$

12. A line segment has endpoints J (5, 8) and L (13, 2). The point K is the midpoint of line segment JL.

A. What is the midpoint? (K)

$$\frac{5+13}{2}, \frac{8+2}{2}$$

$$(9, 5)$$

B. What is the equation of a line perpendicular to JL that passes through K?

$$m = \frac{2-8}{13-5} = \frac{-6}{8} \quad m = \frac{4}{3}$$

$$5 = \frac{4}{3}(9) + b$$

$$5 = 12 + b$$

$$-7 = b$$

$$y = \frac{4}{3}x + 7$$

13: What is the most accurate way to classify a quadrilateral with 2 sets of parallel sides, 4 congruent sides and have congruent opposite angles?

- a) Trapezoid
- b) Rectangle
- ☒ c) Rhombus
- d) Parallelogram

14. Triangle BCD is a right triangle. Sides BC and CD form the right angle. The equation of the line representing side BC is  $4x + 12y = 12$ . If D is located at the point (9,6), what is the equation of the line representing side CD?

☒ A.  $y = 3x - 21$

C.  $y = 3x + 21$

~~B.  $y = \frac{1}{3}x$~~

~~D.  $y = -\frac{1}{3}x - 12$~~

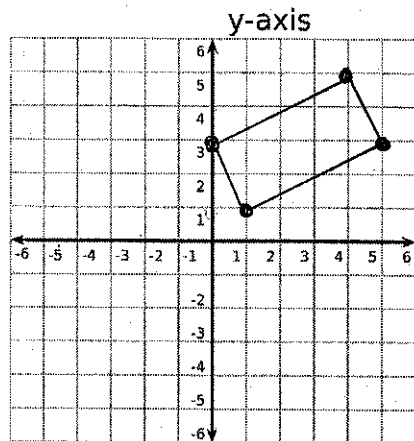
$4x + 12y = 12$

$12y = -4x + 12$

$y = -\frac{1}{3}x + 1$

15. What is the **area** of a rectangle with vertices at:

$R(1, 1), S(5, 3), T(4, 5), \text{ and } U(0, 3)$



$2^2 + 4^2 = 6^2$

$20 = 6^2$

$\sqrt{20} = 6$

$(2)^2 + (1)^2 = 6^2$

$5 = 6^2$

$\sqrt{5} = 6$

$a = 1w$

$a = (\sqrt{20})(\sqrt{5})$

$a = 10 \text{ units}^2$

16. What is the **midpoint** of the longest side of the triangle with the following vertices:  $(-8, 1), (-8, -8) \text{ and } (-3, -8)$

a b c

$ab = 9$

$bc = 5$

$ac = \sqrt{(-3+8)^2 + (-8-1)^2}$

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

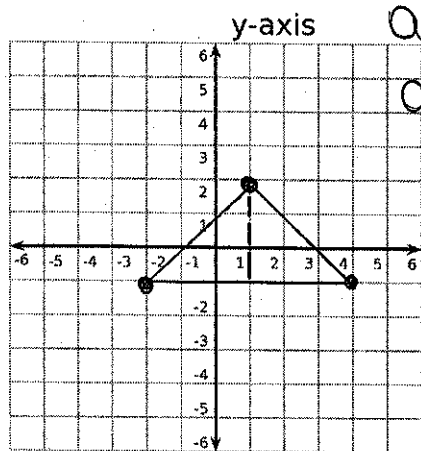
$= \sqrt{100} \text{ longest}$

$= 10.29 \text{ side}$

$\frac{-8+(-3)}{2}, \frac{1+(-8)}{2} \quad (-5.5, -3.5)$

17. What is the area of the triangle with vertices at:

$T(-2, -1), U(1, 2), V(4, -1)$



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

$a = \frac{1}{2}(6)(3)$

$a = 9$

$\text{units}^2$

18. A line,  $y = mx + b$ , passes through the point (2, 8) and is parallel to  $2x + 4$ . What is the value of b?

$8 = 2(2) + b$

$8 = 4 + b$

$b = 4$

19.) Quadrilateral EFGH is a parallelogram because the opposite sides are parallel. The locations of three of the vertices are  $(-3, 1)$ ,  $(9, 4)$  and  $(0, 7)$ . What is the location of a fourth vertex?

- A.  $(-3, 0)$
- ☒ B.  $(-12, 4)$
- C.  $(10, 4)$
- D.  $(1, 7)$

$(10, 4)$

EF

FG

$$m = \frac{4-1}{9-(-3)} = \frac{3}{12}$$

$$m = \frac{7-4}{0-9} = \frac{3}{-9}$$

$$\frac{3}{12} \rightarrow \frac{1}{4}$$

$$\frac{3}{-9} \rightarrow m = -\frac{1}{3}$$

GH

$$m = \frac{4-7}{-12-0} = \frac{-3}{-12} \rightarrow \frac{1}{4}$$

EH

$$m = \frac{4-1}{-12-(-3)} = \frac{3}{-9}$$

20.) Determine the point that is  $\frac{3}{4}$  the distance from  $(22, 0)$  of the segment with endpoints  $(7, 8)$  and  $(22, 0)$ .

