Kinsey – Geometry Name: Answer Key

Unit 3 Review: Geometry in the Coordinate Plane

Date: ______________ Period: ________

<u>NO WORK</u>; <u>NO CREDIT</u>.

PERPENDICULAR AND PARALLEL LINES:

1. The slope of a line that is parallel to $y = 8x + 1$ is ________.
   same
   8

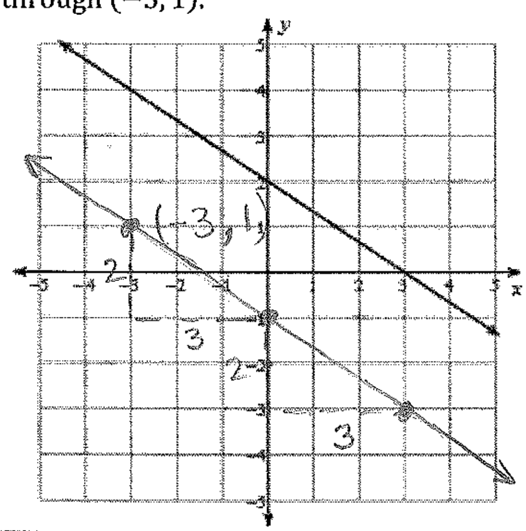
2. The slope of a line that is perpendicular to $y = 8x + 1$ is ________.
   flip fraction & change sign
   $\frac{8}{1} \rightarrow -\frac{1}{8}$

3. Write an equation of a line that is parallel to $y = \frac{1}{5}x - 2$.
   $y = \frac{1}{5}x + 3$
   (many answers, so long as slope stays the same and $b \neq -2$)

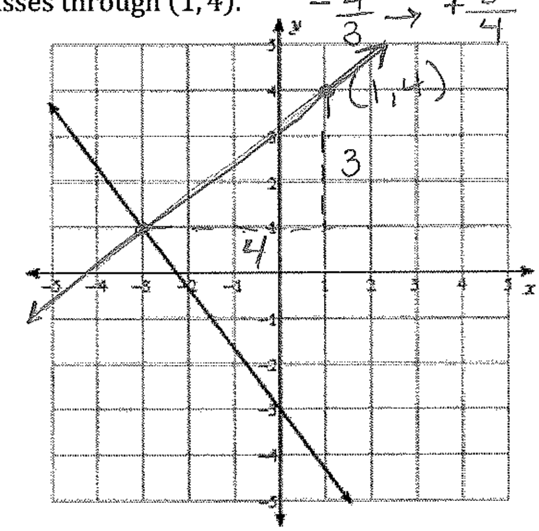
4. Write an equation of a line that is perpendicular to $y = \frac{1}{5}x - 2$.
   $y = -5x - 2$
   (many answers, so long as slope is -5)

5. True or False. The same equation of a line is parallel to itself. For example, $y = 2x - 3$ is parallel to $y = 2x - 3$.
   False, parallel must be distinct/unique.

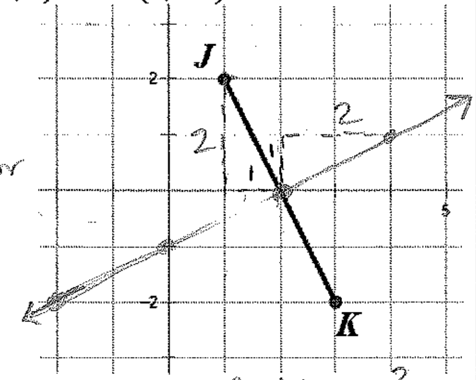
6. Graph a line that is parallel to $y = -\frac{2}{3}x + 2$, and passes through $(-3, 1)$.



7. Graph a line that is perpendicular to $y = \frac{4}{3}x - 3$, and passes through $(1, 4)$.
   $-\frac{4}{3} \rightarrow +\frac{3}{4}$

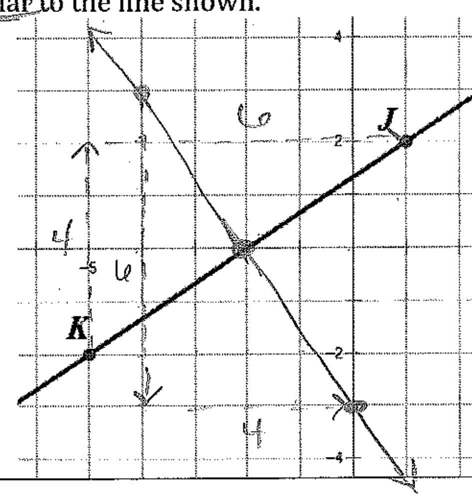


8. Create the graph of the line that is the perpendicular **bisector** of the line segment with endpoints $J(1, 2)$ and $K(3, -2)$.
   bisector: cuts in half; look for middle



   slope of JK: $-\frac{2}{1}$
   $-\frac{2}{1} \rightarrow \frac{1}{2}$

9. A line is show on the graph. Use the grid to graph a line that goes through $(-4, 3)$ and is perpendicular to the line shown.
   $\frac{4}{6} \rightarrow -\frac{6}{4}$
   $\frac{2}{3} \rightarrow -\frac{3}{2}$



Kinsey – Geometry Name: ______________________

Unit 3 Review: Geometry in the Coordinate Plane Date: __________ Period: ______

<u>No work</u>; <u>No credit</u>.

Midpoint and Distance:

10. Find the coordinates of the midpoint of AB given $A(-3, 5)$ and $B(9, -7)$.

$$M\left(\frac{-3+9}{2}, \frac{5+-7}{2}\right) = M\left(\frac{6}{2}, \frac{-2}{2}\right)$$
$$= \boxed{M(3,-1)}$$

11. Find the distance between the points $A(-3, 5)$ and $B(9, -7)$. If necessary, round to the nearest tenth.

$$d = \sqrt{(x_1-x_2)^2+(y_1-y_2)^2}$$
$$= \sqrt{(-3-9)^2+(5+{}^{+}7)^2}$$
$$= \sqrt{(-12)^2+12^2}$$
$$= \sqrt{144+144}$$
$$= \sqrt{288}$$
$$\approx 16.97 \text{ (round up)}$$
$$\approx \boxed{17.0 \text{ units}}$$

Perimeter and Area:

12. Find the perimeter and area of the following figure

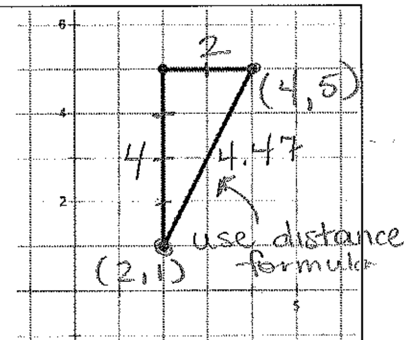
$P = 2+4+4.47$

$\boxed{P = 10.47 \text{ units}}$

$A = \frac{2 \cdot 4}{2} = \frac{8}{2} = 4$

(only need base & height) $\boxed{A = 4 \text{ units}^2}$

$$d = \sqrt{(4-2)^2+(5-1)^2}$$
$$= \sqrt{2^2+4^2}$$
$$= \sqrt{4+16}$$
$$= \sqrt{20}$$
$$\approx 4.47$$



13. Find the perimeter and area of the following rectangle

$$d_{AB} = \sqrt{(-5-1)^2+(1-4)^2}$$
$$= \sqrt{(-5+1)^2+(1-4)^2}$$
$$= \sqrt{(-4)^2+(-3)^2}$$
$$= \sqrt{16+9}$$
$$= \sqrt{25}$$
$$= 5 \text{ units}$$

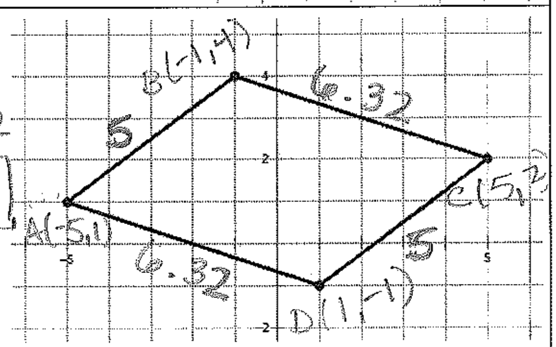
$P = 5+5+6.32+6.32$

$\boxed{P = 22.64 \text{ units}}$

$$d_{BC} = \sqrt{(-1-5)^2+(4-2)^2}$$
$$= \sqrt{(-6)^2+2^2}$$
$$= \sqrt{36+4}$$
$$= \sqrt{40}$$
$$\approx 6.32 \text{ units}$$

$A = 5 \cdot 6.32$

$\boxed{A = 31.6 \text{ units}^2}$



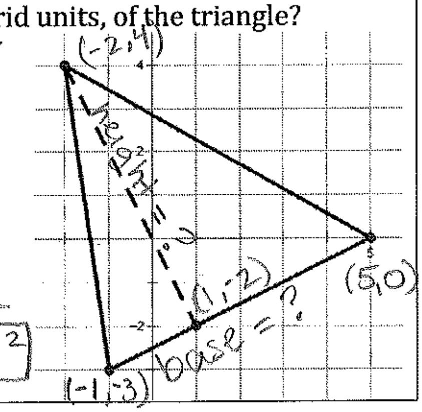
14. A triangle is shown on the coordinate plane. What is the area, in square grid units, of the triangle?

*use distance formula first to find base and height

$$d_{base} = \sqrt{(-1-5)^2+(-3-0)^2}$$
$$= \sqrt{(-6)^2+(-3)^2}$$
$$= \sqrt{36+9}$$
$$= \sqrt{45} \approx 6.71 \text{ units}$$

$$d_{height} = \sqrt{(1+{}^{+}2)^2+(-2-4)^2}$$
$$= \sqrt{3^2+(-6)^2}$$
$$= \sqrt{9+36}$$
$$= \sqrt{45} \approx 6.71 \text{ units}$$

$$A = \frac{\text{base} \cdot \text{height}}{2} = \frac{\sqrt{45} \cdot \sqrt{45}}{2} = \frac{45}{2} = \boxed{22.5 \text{ units}^2}$$



Kinsey – Geometry Name: ____________________

Unit 3 Review: Geometry in the Coordinate Plane Date: __________ Period: ______

NO WORK; NO CREDIT.

15. To the nearest tenth of a unit, what is the perimeter of a triangle with vertices at $\overset{A}{(2,3)}$, $\overset{B}{(1,1)}$, and $\overset{C}{(0,6)}$?

*use distance formula first to find the 3 side lengths of the Δ

$d_{AB} = \sqrt{(2-1)^2+(3-1)^2} = \sqrt{1^2+2^2} = \sqrt{1+4} = \sqrt{5} \approx 2.23$

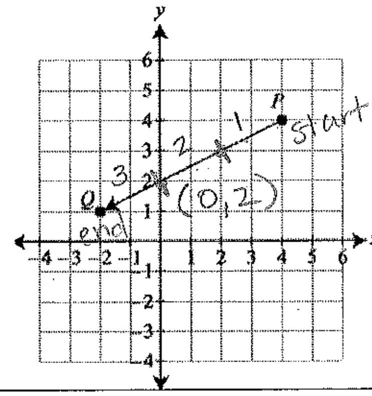
$d_{BC} = \sqrt{(1-0)^2+(1-6)^2} = \sqrt{1^2+(-5)^2} = \sqrt{1+25} = \sqrt{26} \approx 5.10$

$d_{AC} = \sqrt{(2-0)^2+(3-6)^2} = \sqrt{2^2+(-3)^2} = \sqrt{4+9} = \sqrt{13} \approx 3.61$

$P = \sqrt{5}+\sqrt{26}+\sqrt{13} \approx \boxed{10.9 \text{ units}}$

PARTITIONING LINE SEGMENTS:

16. Directed line segment PQ is shown on the coordinate plane. What are the coordinates of the point $\frac{2}{3}$ of the way from point $P(4,4)$ to point $Q(-2,1)$?



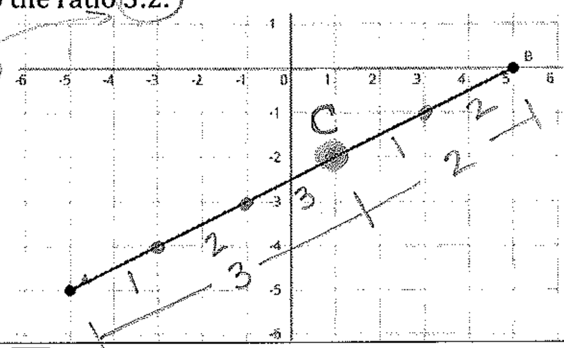
$\frac{2}{3}$ ← split in THREE pieces
move to the point after TWO of those three pieces

$\boxed{(0,2)}$

17. Plot the point C that partitions $\overline{AB}$, shown on the graph, into the ratio 3:2.

- split $\overline{AB}$ into 5 pieces (3+2)
- starting at A count THREE
- that is point C

$\boxed{C(1,-2)}$



18. Given $A(-4,1)$ and $B(4,5)$ find the coordinates of point P on $\overline{AB}$ such that $3AP = PB$.

A(-4,1) P(x,y) B(4,5)

$1:3 = \frac{1}{3}$ ← ratio

Method 1:

$\frac{x+4}{4-x} = \frac{1}{3}$

$3x+12 = 4-x$

$4x+12 = 4$

$4x = -8$

$x = -2$

$\frac{y-1}{5-y} = \frac{1}{3}$

$3y-3 = 5-y$

$4y-3 = 5$

$4y = 8$

$y = 2$

P(-2,2)

Method 2:

$\frac{-4-x}{x-4} = \frac{1}{3}$

$-12-3x = x-4$

$-12 = 4x-4$

$-8 = 4x$

$-2 = x$

$\frac{1-y}{y-5} = \frac{1}{3}$

$3-3y = y-5$

$3 = 4y-5$

$8 = 4y$

$2 = y$

P(-2,2)

$\boxed{P(-2,2)}$