Coordinate Geometry Review

Name: **KEY**

Date: _____

1. If the vertices of $\triangle ABC$ are $A(-2, 4)$, $B(-2, 8)$, and $C(-5, 6)$, then $\triangle ABC$ is classified as

   See Graph

   (1) right   (2) scalene

   (3) **isosceles**   (4) equilateral

   $dBC = 3^2 + 2^2$ $dAC = 3^2 + 2^2$

   $= 9 + 4$ $= 9 + 4$

   $= \sqrt{13}$ $= \sqrt{13}$

2. In slope-intercept form, what is the equation of the line parallel to the line $3x + 4y = 5$ and having the same x-intercept as $5x + 6y = 40$?

   $3X + 4Y = 5$

   $4y = -3x + 5$

   $\dfrac{4}{4} \quad \dfrac{4}{4} \quad \dfrac{4}{4}$

   (1) $y = -\frac{3}{4}x + 6$ (2) $y = \frac{3}{4}x + 2$

   (3) $y = -\frac{4}{3}x + 6$ (4) $y = \frac{4}{3}x + 6$

   $Y = \frac{-3}{4}X + \frac{5}{4}$

3. Point M is the midpoint of $\overline{AB}$. If the coordinates of A are $(-3, 6)$ and the coordinates of M are $(-5, 2)$, what are the coordinates of B?
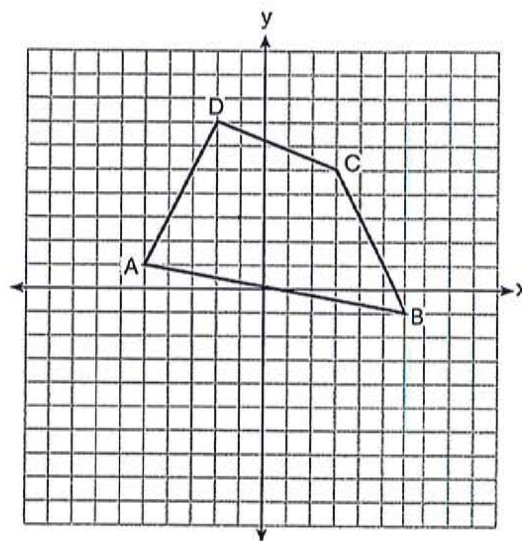
   (1) $(1, 2)$ (2) $(7, 10)$

   (3) $(-4, 4)$ (4) **$(-7, -2)$**

   $\dfrac{-3 + X}{2} = \dfrac{-5}{1}$

   $-3 + X = -10$

   $X = -7$

4. In the diagram below, quadrilateral $ABCD$ has vertices $A(-5, 1)$, $B(6, -1)$, $C(3, 5)$, and $D(-2, 7)$.

   What are the coordinates of the midpoint of diagonal $\overline{AC}$?

   (1) **$(-1, 3)$**   (2) $(1, 3)$

   (3) $(1, 4)$ (4) $(2, 3)$

   $\dfrac{-5 + 3}{2}, \dfrac{1 + 5}{2}$

   $\dfrac{-2}{2}, \dfrac{6}{2}$

   $-1, 3$

5. Consider the following four linear equations:

   $3_y = 4x + 3$

   $Y = \frac{4}{3}X + 1$

   I. $-3x + 4y = 8$ $\quad 4_y = 3x + 8$ $\quad Y = \frac{3}{4}X + 2$

   II. $-4x + 3y = 3$

   III. $6x + 8y = 10 \rightarrow 8_y = -6x + 10$ $\quad Y = \frac{-3}{4}X + \frac{5}{4}$

   $Y = \frac{3}{4}X - 5 \leftarrow$ IV. $-\frac{3}{4}x + y = -5$

   Which of the above lines are perpendicular?

   (1) I and II $\quad\quad$ (2) II and III
   (3) I and IV $\quad\quad$ (4) III and IV

6. What is the length of $\overline{RS}$ with $R(-2, 3)$ and $S(4, 5)$?

   (1) $2\sqrt{2}$ $\quad\quad\quad$ (2) 40
   (3) $2\sqrt{10}$ $\quad\quad\quad$ (4) $2\sqrt{17}$

   $(-2-4)^2 + (3-5)^2$

   $(-6)^2 + (-2)^2$
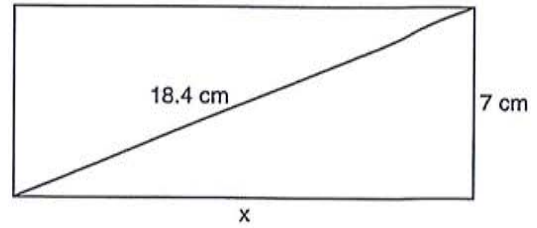
   $36 + 4$

   $\sqrt{40}$

   $4 \cdot 10$

   $2\sqrt{10}$

7. The rectangle shown below has a diagonal of 18.4 cm and a width of 7 cm.

   To the *nearest centimeter*, what is the length, x, of the rectangle?
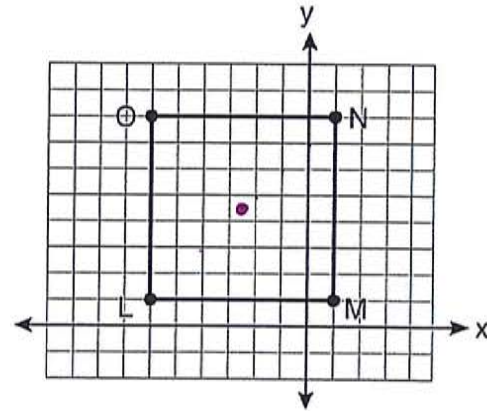
   (1) 11 $\quad$ (2) 17 $\quad$ (3) 20 $\quad$ (4) 25

   $x^2 + 7^2 = 18.4^2$

   $x^2 + 49 = 338.56$

   $x^2 = 289.56$

8. Square *LMNO* is shown in the diagram below.

   What are the coordinates of the midpoint of diagonal $\overline{LN}$?

   (1) $(4\frac{1}{2}, -2\frac{1}{2})$ $\quad\quad$ (2) $(-3\frac{1}{2}, 3\frac{1}{2})$
   (3) $(-2\frac{1}{2}, 3\frac{1}{2})$ $\quad\quad$ (4) $(-2\frac{1}{2}, 4\frac{1}{2})$

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9. The midpoint of $\overline{AB}$ is $M(4, 2)$. If the coordinates of A are $(6, -4)$, what are the coordinates of B?

(1) $(1, -3)$ (2) $(2, 8)$

(3) $(5, -1)$ (4) $(14, 0)$

$$\frac{6+x}{2} = \frac{4}{1}$$

$$6 + x = 8$$

$$x = 2$$

11. Which equation describes the line that is parallel to $y = -\frac{4}{3}x - 1$?

(1) $y = \frac{4}{3}x - 4$ (2) $y = \frac{3}{4}x + 1$

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

Same Slope

10. The coordinates of the vertices of triangles are given below. Which is a right triangle?

✗ (1) $D(-8, -2)$, $E(-1, -5)$, $F(2, 3)$

✗ (2) $A(5, -1)$, $B(3, 5)$, $C(-2, -3)$

(3) $K(0, 1)$, $L(-3, -8)$, $M(3, -5)$

(4) $X(-7, 2)$, $Y(-4, -3)$, $Z(2, 0)$

$$m\,KM = \frac{-5-1}{3-0} = \frac{-6}{3}$$

$$m\,LM = \frac{-5-(-8)}{3-(-3)} = \frac{3}{6}$$

Neg Reciprocal Slopes

12. Which of the following systems represent a pair of lines that are perpendicular to each other?

(1) $2x + 3y = 6$
$3x + 2y = 6$

(2) $2x + 3y = 6$
$-3x + 2y = 6$

(3) $2x + 3y = 6$
$-2x + 3y = 6$

(4) $3x + 2y = 6$
$-3x + 2y = 6$

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

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

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13. Determine an equation of the line which is the perpendicular bisector of the segment whose endpoints are $(-4, -6)$ and $(-6, 7)$.

$mdpt \left(\dfrac{-4 + -6}{2}, \dfrac{-6 + 7}{2}\right) = \left(\dfrac{-10}{2}, \dfrac{1}{2}\right) = \left(-5, \dfrac{1}{2}\right)$

$slope \dfrac{7 - (-6)}{-6 - (-4)} = \dfrac{13}{-2}$

$Y - \dfrac{1}{2} = \dfrac{2}{13}(x + 5)$

14. Write an equation of the straight line which is perpendicular to the line $2x - 3y = 5$ at the point $(4, 1)$.

$-3y = -2x + 5$

$Y = \dfrac{2}{3}x - \dfrac{5}{3}$

$m = \dfrac{2}{3} \qquad \perp m = \dfrac{-3}{2}$

$Y - 1 = \dfrac{-3}{2}(x - 4)$

15. Write an equation of the line parallel to $2x - 5y = 6$ that passes through the point $(1, -3)$.

$-5y = -2x + 6$

$Y = \dfrac{2}{5}x + \dfrac{-6}{5}$

Same Slope

$Y + 3 = \dfrac{2}{5}(x - 1)$

16. Write an equation of the straight line parallel to the line given by the equation $2x + 4y + 5 = 0$ and passing through the origin.

$4y = -2x - 5$

$Y = \dfrac{-1}{2}x - \dfrac{5}{4}$

$Y = \dfrac{-1}{2}x$

17. Find, in radical form, the length of the line segment with endpoints whose coordinates are $(-1, 4)$ and $(3, -2)$.

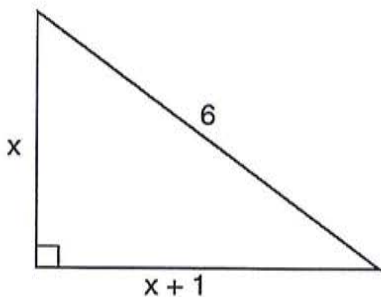$$(-1-3)^2 + (4-(-2))^2$$

$$(-4)^2 + (6)^2$$

$$16 + 36$$

$$\sqrt{52}$$

$$4 \cdot 13$$

$$\boxed{2\sqrt{13}}$$

18. As shown in the accompanying diagram, the hypotenuse of the right triangle is 6 meters long. One leg is 1 meter longer than the other. Find the lengths of *both* legs of the triangle, to the *nearest hundredth of a meter.*

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

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

$$2x^2 + 2x - 35 = 0$$

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(2)(-35)}}{2(2)}$$

$$x = \frac{-2 \pm \sqrt{284}}{4}$$

$$x = 3.71$$

$$4.71$$

19. Given the triangle whose vertices are at $A(3, 3)$ 2 $B(6, 2)$, and $C(8, -2)$. What is the slope of the altitude to side AC?

$$m\ AC = \frac{-2-3}{8-3} = \frac{-5}{5} = -1$$

$$\perp m = 1$$

20. The endpoints of $\overline{AB}$ are $A(3, -4)$ and $B(7, 2)$. Determine and state the length of $\overline{AB}$ in radical form.
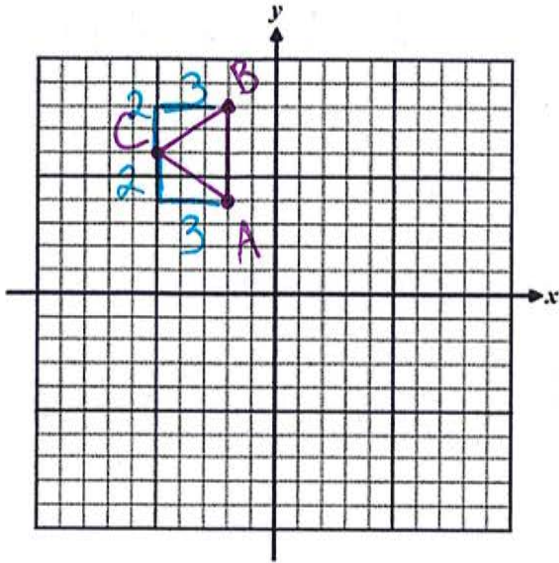
$$(-4-2)^2 + (3-7)^2$$

$$(-6)^2 + (-4)^2$$

$$36 + 16$$

$$\sqrt{52}$$

$$4 \cdot 13$$

$$\boxed{2\sqrt{13}}$$

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