Fall 06 Algebra Evaluation

MTY Academy   Fall 06-Algebra

1. Given points $A = \left(-\dfrac{1}{4}, -3\right)$ and $B = (-3, 2)$, do each of the following problems. Simplify your answers, if possible.

   (1) Find the distance between A and B.

   (2) Find the midpoint of the line segment joining A and B.

   (3) Find the slope of line passing through A and B.

---

2. For each pair of points below, determine whether a line passing through given points is horizontal, or vertical, or neither, using the slope formula. Box your answers.

   (1) $(2, -4)$ and $(-3, 7)$

   (2) $(-3, 9)$ and $(-3, -1)$

   (3) $(-2, -3)$ and $(-2, 5)$

---

3. Given three points $A = (1, 7)$, $B = (-3, -2)$, $C = (5, 16)$, determine whether they are collinear. Show your work in detail.

---

4. Find the value of a if the line passing through $(1, -3)$ and $(a, 6)$ has the slope $-\frac{2}{3}$.

---

5. Find the value of k so that the line passing through $(3, 4k)$ and $(k, 5)$ has the slope -3.

---

6. Determine whether each pair of the following lines are parallel, perpendicular, or neither, **using the slope**.

   (1) $L_1:$ $A = (2, 3),$ $B = (-2, 8)$
        $L_2:$ $C = (-2, 3),$ $D = (-7, -1)$

   (2) $L_1:$ $A = (-2, 1),$ $B = (-4, 5)$
        $L_2:$ $C = (-4, -5),$ $D = (8, -1)$

   (3) $L_1:$ $A = (2, 3),$ $B = (-2, 8)$
        $L_2:$ $C = (1, -2),$ $D = (-3, 3)$

7. Let L_1 be a line passing through $A = (-2, 4)$ and $B = (3, -4)$. Let L_2 be a line passing through $C = (2, -8)$ and $B = (a, 4)$. Find the value of a if the two lines are parallel.

8. Let L_1 be a line passing through $A = (-2, 4)$ and $B = (3, -4)$. Let L_2 be a line passing through $C = (2, -8)$ and $B = (a, 4)$. Find the value of a if the two lines are perpendicular.

9. Let L_1 be a line passing through $A = (4, -7)$ and $B = (-2, 3)$. Let L_2 be a line passing through $C = (a, -3)$ and $D = (5, 1)$.

   (1) Find the slope of line L_1.

   (2) Find the value of a if L_1 and L_2 are parallel.

   (3) Draw the lines and label two points on each line.

10. For each of the following equations, find x- and y-intercepts, if any. Then draw a line and label intercept(s).

    (1) $3x + 5y = 15$

    (2) $\frac{2}{5}x - \frac{3}{2}y = -2$

    (3) $4y = 3$

11. Given $2x + y = 2$,

    (1) find the x- and y- intercepts.

    (2) draw the line and indicate the intercepts on your line.

    (3) Find the slope of the line.

    (4) Let L be the line passing $(-2 + a, 8)$ and $(3a, 10)$. If L is parallel to the line with equation $2x + y = 6$, what is the value of a?

12. Line L passes through point $(-1, 2)$ and has the slope $-\frac{2}{3}$.

    (1) Use the the point and the slope to find a new point.

    (2) Draw line L by connecting two points and label them on line.

13. Given $y + 3 = -\dfrac{1}{2}(x - 2)$,

    (1) find the x and y-intercepts.

    (2) find the slope of the line.

    (3) write the equation in standard form $Ax + By = C$, where A, B and C are integers.

---

14. Find an equation in point-slope form

$$y - y_0 = m(x - x_0),$$

if the line has the indicated information below. Also **DRAW** the line and **LABEL** two points on your line.

    (1) slope of -4 and a point $(2, -3)$

    (2) two points $(2, -3)$ and $(-4, 1)$

    (3) slope of $\frac{2}{3}$ and cross the x-axis at -3

---

15. Let L be a line that has the slope $-\frac{2}{5}$ and passes through point $(-2, 5)$.

    (1) Find the equation in slope-intercept form $y = mx + b$ for L.

    (2) Draw the line L and label two points.

---

16. Let L be a line that passes through two points $(-1, 3)$ and $(2, -9)$.

    (1) Find the equation in slope-intercept form $y = mx + b$ for L.

    (2) Rewrite the equation in standard form.

    (3) Find the intercepts.

---

17. Line L has the equation $2x + 4y = 5$.

    (1) Find the slope and the y-intercept.

    (2) Let K be the line passing through a point $(-1, 3)$ and parallel to line L. Draw line K and label two points.

    (3) Find the equation of line K in standard form.

---

18. Let L_1 be a line perpendicular to line L_2 that has the equation $3x + 6y = 7$. If L_1 has the x-intercept of $(-3, 0)$, find the equation of line L_1 in standard form.

19. Find the equation in **slope-intercept form** of line L that passes through a point $(-5, -7)$ and parallel to the line with equation $2x - 3y = 8$.

___

20. Find the equation in **standard form** of line L that passes through a point $(-2, -\frac{2}{3})$ and perpendicular to the line with equation $y = -\frac{4}{7}x + 9$.

___

21. Determine whether the system is independent, inconsistent, or dependent, by using slopes of lines.
$$2x + 5y = 4$$
$$6x - 9y = 12$$

___

22. Solve each of the following systems of equations, using the **substitution** method.

(1) $\begin{aligned} 4x - y &= 7 \\ 3x + 2y &= 19 \end{aligned}$

(2) $\begin{aligned} 2x - 5y &= -2 \\ 3x + 7y &= 1 \end{aligned}$

___

23. Solve each of the following systems of equations, using the **elimination** method.

(1) $\begin{aligned} 2x + 2y &= 7 \\ 5x - 4y &= 4 \end{aligned}$

(2) $\begin{aligned} 2x - 5y &= -2 \\ 3x + 7y &= 1 \end{aligned}$

___

24. Given
$$\begin{aligned} -4x + 6y &= 3 \\ x - 9y &= -8 \end{aligned}$$

find the average value of x and y.

___

25. David has some quarters and nickels. There are 74 coins in all and the total value of the coins is \$9.30.

(1) Write a system of equations to represent the situation.

(2) How many coins of each type does David have?