

Algebra 1 Linear Emphasis - Midterm Review

Evaluate the expression for the given value of the variable.

1.) $15a$ when $a = 7$ $15(7)$ 105

2.) $\frac{c}{23}$ when $c = 391$ $\frac{391}{23}$ 17

3.) $\frac{5}{7}x$ when $x = \frac{2}{5}$ ~~$\frac{5}{7} \cdot \frac{2}{5}$~~ $\frac{2}{7}$

Evaluate the expression for the given value(s) of the variable(s).

4.) $3y^2$ when $y = 5$ $3 \cdot 25$ 75

5.) $(4x)^3$ when $x = 2$ $(4(2))^3$ 8^3 512

6.) $(c-d)^2$ when $c = 10$ & $d = 3$ $(10-3)^2$ 7^2 49

Evaluate the expression. Use PEMDAS

7.) $3^3 - (12 \div 4)$ $27 - 12 \div 4$ $27 - 3$ 24 24

8.) $2 + (21 \div 3) - 6$ $2 + 7 - 6$ 3

9.) $[(5 \cdot 2^3) + 8] \div 16$ $((5 \cdot 8) + 8) \div 16$ $48 \div 16$ 3

Write the verbal sentence as an equation AND solve.

10.) Thirteen less than the product of 25 and a number x is 37.

equation: $25x - 13 = 37$

$$25x = 50$$
$$x = 2$$

solve for x : 2

Simplify the expression.

11.) $-16 + 13 - 3^2$
 $-16 + 13 - 9$
 $-3 - 9$

$$-12$$

12.) $3.6 - 2.4 - (-6.1)$
 1.2

$$7.3$$

13.) $2x(7 - x) + 3x^2$
 $14x + 2x^2 + 3x^2$

$$14x + x^2$$

Perform the indicated matrix operations, if possible.

14.) $\begin{bmatrix} 8 & -4 \\ 9 & 3 \end{bmatrix} + \begin{bmatrix} -2 & 6 \\ -1 & 5 \end{bmatrix} = ?$ $\begin{bmatrix} 6 & 2 \\ 8 & 8 \end{bmatrix}$

15.) $\begin{bmatrix} -6 & 8 & 3 \\ 4 & 2 & 6 \\ 0 & 10 & -9 \end{bmatrix} - \begin{bmatrix} 6 & 8 & -2 \\ 7 & -2 & 1 \\ -7 & 8 & 4 \end{bmatrix} = ?$ $\begin{bmatrix} -12 & 0 & 5 \\ -3 & 4 & 5 \\ 7 & 2 & -13 \end{bmatrix}$

Solve the equations. Show work.

16.) $a - (-6) = 22$

$$\begin{array}{r} a + 6 = 22 \\ \underline{-6} \quad \underline{-6} \end{array}$$

$a = \boxed{16}$

17.) $\frac{3}{8}t = 0$

$t = \boxed{0}$

18.) $6x + 8 = 32$

$$6x = 24$$

$x = \boxed{4}$

19.) $-x - 5 + 3x = 1$

$$\begin{array}{r} 2x - 5 = 1 \\ +5 \quad +5 \\ \hline 2x = 6 \end{array}$$

$x = \boxed{3}$

20.) $-3(-x - 4) = 2x + 1$

$$\begin{array}{r} 3x + 12 = 2x + 1 \\ -2x \quad -12 \quad -2x \quad -12 \\ \hline x = -11 \end{array}$$

$x = \boxed{-11}$

21.) $4\left(\frac{1}{2}x + \frac{1}{2}\right) = 2x + 2$

$$2x + 2 = 2x + 2$$

$x = \boxed{\text{ALL REAL \#}'S}$

22.) $x + |5| = -3$

$$\begin{array}{r} x + 5 = -3 \\ \underline{-5} \quad \underline{-5} \end{array}$$

$x = \boxed{-8}$

23.) $-|-3| + 7 = 4x$

$$\begin{array}{r} -3 + 7 = 4x \\ 4 = 4x \end{array}$$

$x = \boxed{1}$

24.) $18.25w - 4.15 = 2.75w$

$$15.5w = 4.15$$

$$1550w = 4150$$

$$w = \frac{415}{1550} = \frac{83}{310}$$

$w = \boxed{\frac{83}{310}}$
 $(\text{or } .27)$

Rewrite the equations in slope intercept form.

25.) $3x - 2y = 6$

$-2y = -3x + 6$

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

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

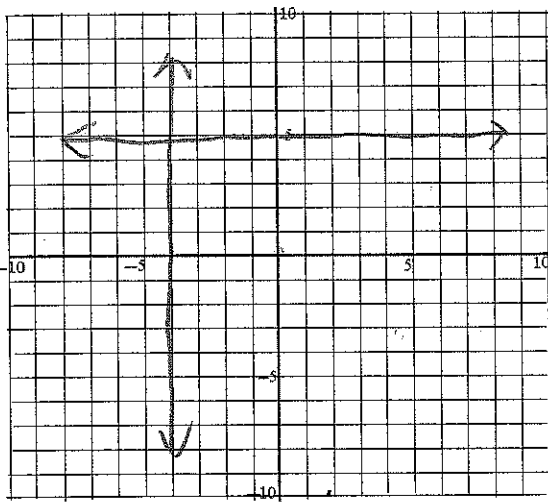
26.) $10x + 6y = -12$

$6y = -10x - 12$

$y = -\frac{10}{6}x - 2$

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

27.) Graph the equations $y = 5$ & $x = -4$ on the same graph below.



What is the slope of the line $y=5$

0

What is the slope of the line $x=-4$

undefined

point of intersection: $(-4, 5)$

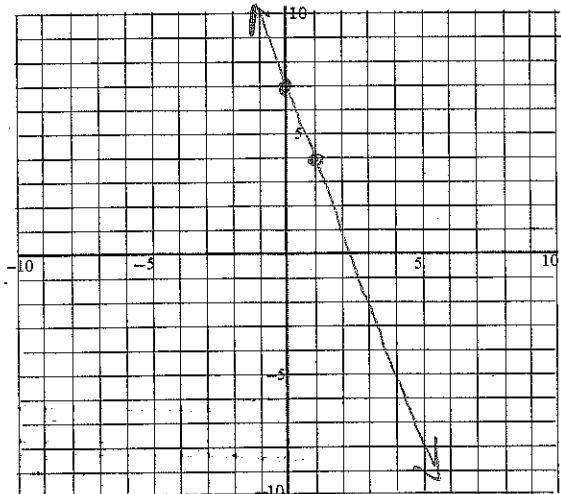
(meaning not with a table of values)

Graph the equation below using the shortcut. Hint: plot the y -intercept (b) first and then use the slope to get your other point.

28.) $y = -3x + 7$

Start up 7

then go down 3 and right 1



Find the x & y intercepts for the equations below.

29.) $2x - y = 6$

"COVER UP" METHOD

$$\begin{aligned} 2x &= 6 & -y &= 6 \\ x &= 3 & y &= -6 \end{aligned}$$

x-int (3, 0)

y-int (0, -6)

30.) $y = -4x + 8$

$$\begin{aligned} 4x + y &= 8 \\ 4x &= 8 & y &= 8 \\ x &= 2 \end{aligned}$$

x-int (2, 0)

y-int (0, 8)

Find the slope of the line passing through the points. Show work.

31.) (-4, 2) & (-3, -5)

$$m = \frac{-5 - 2}{-3 - (-4)} = \frac{-7}{1}$$

$m = \frac{-7}{1}$

32.) (3, 6) & (3, -1)

$$\frac{-1 - 6}{3 - 3} = \frac{-7}{0} \text{ simplify } \rightarrow$$

$m = \text{undefined}$

33.) (6, 1) & (-4, 1)

$$\frac{1 - 1}{-4 - 6} = \frac{0}{-10} \text{ simplify } \rightarrow$$

$m = \frac{0}{-10}$

34.) Name two equations of lines that are parallel.

$Y = \frac{3}{4}x + 2$ $Y = \frac{3}{4}x - 4$

THE 2 EQUATIONS SHOULD HAVE THE SAME SLOPE

35.) Name two equations of lines that are perpendicular.

$Y = 4x + 5$ $Y = -\frac{1}{4}x + 1$

THE 2 EQUATIONS SHOULD HAVE OPPOSITE RECIPROCAL SLOPES

36.) Name two equations of lines that are neither parallel nor perpendicular.

$Y = \frac{2}{3}x + 7$ $Y = 6x - 3$

SLOPES ARE ANYTHING BUT SAME OR OPPOSITE RECIPROCALS

Write an equation of the line in slope-intercept form ($y = mx + b$)

37.) $m = -5$; $b = 10$

$$y = -5x + 10$$

38.) $m = 8$ passing through $(1, 5)$ hint: find b first

$$y = mx + b$$

$$5 = 8(1) + b$$

$$5 = 8 + b$$

$$-\frac{8}{8} - \frac{8}{8} + b$$

$$-3 = b$$

$$y = 8x - 3$$

39.) $(3, -2)$ & $(5, 4)$

hint: find the slope (m) first, then find the y intercept (b)

$$m = \frac{4 - (-2)}{5 - 3} = \frac{6}{2} = 3$$

YOU COULD ALSO WRITE A POINT-SLOPE EQUATION AND CONVERT IT TO $y = mx + b$

$$y = mx + b$$

$$-2 = 3(3) + b \quad (\text{or}) \quad 4 = 3(5) + b$$

$$-2 = 9 + b \quad 4 = 15 + b$$

$$-11 = b \quad -11 = b$$

$$y = 3x - 11$$

$$y - 4 = 3(x - 5)$$

$$y - 4 = 3x - 15$$

$$+4 \quad +4$$

$$y = 3x - 11$$

40.) What is the slope of the graph of $y = -10x + 1$

$$m = -10$$

41.) What is the slope of the graph of $5x + 2y = -10$

$$-5x \quad -5x$$

$$\frac{2y}{2} = \frac{-5x - 10}{2}$$

$$y = \frac{-5}{2}x - 5$$

$$m = -\frac{5}{2}$$

Write the point-slope form of the equation of the line that passes through the point and has the given slope. $y - y_1 = m(x - x_1)$

42.) $m = -\frac{1}{2}$; $(2, 4)$

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

43.) $m = 4$; $(-1, -7)$

$$y + 7 = 4(x + 1)$$

Write an equation in *standard form* (with integer coefficients) of the line that passes through the given point and has the given slope. $Ax + By = C$

44.) $m = 3$; $(5, -2)$

$$y + 2 = 3(x - 5)$$

$$y + 2 = 3x - 15$$

$$y = 3x - 17$$

$$\boxed{-3x + y = -17}$$

or $3x - y = 17$

Write the equation below in *standard form with integer coefficients*.

45.) $y = \frac{3}{4}x - 6$

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

$$-3x + 4y = -24$$

$$\boxed{-3x + 4y = -24}$$

or $3x - 4y = 24$

46.) Is $(1, 5)$ a solution to $3x + 2 = 5$?

$$3(1) + 2 = 5$$

$$3 + 2 = 5$$

$$5 = 5$$

YES

47.) Is $(0, -2)$ a solution to $5x - 2 = -2y$?

$$5(0) - 2 = -2(-2)$$

$$0 - 2 = 4$$

$$-2 = 4$$

NO

48.) Is $(-10, -3)$ a solution to $-x + -3 = -13y$?

$$-(-10) + -3 = -13(-3)$$

$$10 - 3 = 39$$

$$7 = 39$$

NO

49.) Zoltar the Magician has a broken magic hat. He is supposed to be able to pull out a bunny rabbit but each time he reaches in he never knows for sure what he will pull out. Inside his magic hat he has 13 flaming swords, 5 1-gallon containers of milk, 2 rabbits, and 10 coins for hiding behind people's ears.

(30 things total)

A) What is the probability that Zoltar will reach into the hat and pull out a rabbit?

$$\frac{2}{30} = \frac{1}{15}$$

B) What is the probability that Zoltar pulls out a gallon of milk, puts it back in embarrassment, and then pulls out the rabbit.

milk = $\frac{5}{30} = \frac{1}{6}$

rabbit = $\frac{1}{15}$

$$\frac{1}{6} \cdot \frac{1}{15} = \frac{1}{90}$$