

Equations and Linear Functions

Name: _____

1. If $8x = -4(x + 3)$ then x equals:

(A) -1
 [B] 1
 [C] $\frac{3}{4}$
 [D] $\frac{1}{4}$

$$8x = -4x - 12$$

$$+4x \quad +4x$$

$$12x = -12$$

$$\frac{12x}{12} = \frac{-12}{12}$$

$$x = -1$$

2. Solve for x : $9x^2 - c = d$

(A) $x = \frac{\sqrt{d+c}}{3}$
 [B] $x = 2\frac{d+c}{9}$
 [C] $x = \frac{-9dc}{2}$
 [D] $x = \sqrt{9cd}$

$$9x^2 - c = d$$

$$+c \quad +c$$

$$9x^2 = c + d$$

$$\frac{9x^2}{9} = \frac{c+d}{9}$$

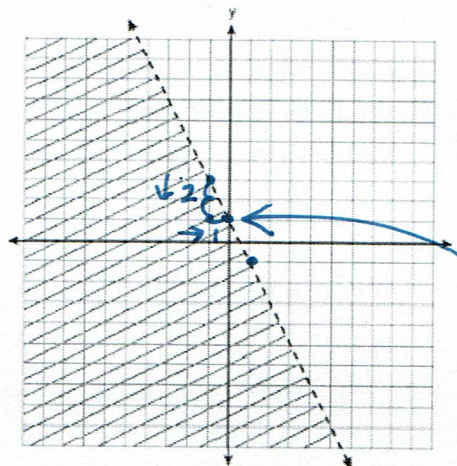
$$x^2 = \frac{c+d}{9}$$

$$\sqrt{x^2} = \sqrt{\frac{c+d}{9}}$$

$$x = \frac{\sqrt{c+d}}{3}$$

3. Which inequality is represented by the graph at the right?

- (A) $y < -2x + 1$
 [B] $y < 2x + 1$
 [C] $y < -\frac{1}{2}x + 1$
 [D] $y < \frac{1}{2}x + 1$



slope = $\frac{-2}{+1} = -2$
 y-int = pos. 1
 shaded below the dashed line

4. Jared can run 520 yards in one minute. How fast does he run in feet per second?

- [A] 12 (B) 26 [C] 1560 [D] 16

$$520 \text{ yd} \left(\frac{3 \text{ ft}}{1 \text{ yd}} \right) = 1560 \text{ ft}$$

$$\frac{1560 \text{ ft}}{60 \text{ sec.}} \left[\frac{1 \text{ min} (60 \text{ sec})}{1 \text{ min}} \right] = 26 \text{ ft/sec}$$

5. There are three consecutive integers such that the sum of the two smallest integers is 17 less than three times the largest. What is the smallest integer?

- [A] 5 [B] 7 (C) 12 [D] 6

sum { x = smallest integer
 $x+1$ = middle integer
 $x+2$ = largest integer

6. Which expression is equivalent to: $(16x^{-6}y^4z^8)^{-\frac{1}{4}}$

- [A] $16x^{\frac{3}{2}}yz^2$ [B] $2x^2yz^2$ (C) $\frac{x^3}{2yz^2}$ [D] $\frac{x^3}{16yz^2}$

$$16^{-\frac{1}{4}} x^{-\frac{6}{4}} y^{\frac{4}{4}} z^{\frac{8}{4}} \rightarrow -x^{\frac{3}{2}} y^{-1} z^{-2}$$

$$2x + 1 = 3(x + 2) - 17$$

$$2x + 1 = 3x + 6 - 17$$

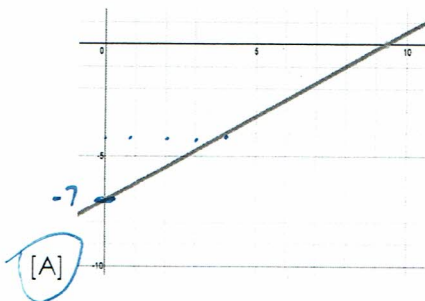
$$2x + 1 = 3x - 11$$

$$-3x - 1 - 3x - 1$$

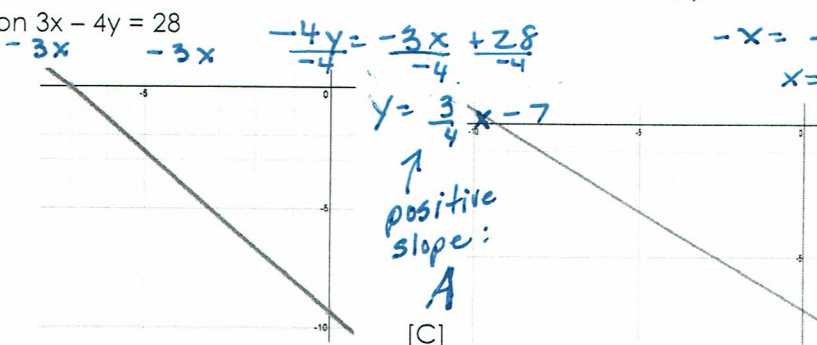
$$-x = -12$$

$$x = 12$$

7. Which graph below displays the equation $3x - 4y = 28$



[B]



[C]

$$3x - 4y = 28$$

$$-4y = -3x + 28$$

$$\frac{-4y}{-4} = \frac{-3x + 28}{-4}$$

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

positive slope:
A

8. Compare the slope of $f(x) = -2x + 3$ and the slope of the chart of $g(x)$ below:

x	2	4	6	8
g(x)	-8	-2	4	10

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{10 - 4}{8 - 6} = \frac{6}{2} = 3$$

What is the positive difference between the slopes of $f(x)$ and $g(x)$?

- [A] 1 [B] 5 [C] 8 [D] 17

$$3 - (-2) = 5$$

$$-2 - 3 = -5$$

9. Gregory teaches martial arts. He charges a one-time processing fee of \$5.00 and the cost of the classes is shown below. Let x represent the number of classes and y represent the cost of classes.

Number of Classes, x	1	2	3	4
Cost of Classes(not including processing fee), y	\$15.00	\$27.00	\$39.00	\$51.00

$+5$
20 32 44 56

Based on this information, what will it cost to take 10 classes?

- [A] \$123 [B] \$128 [C] \$118 [D] \$153

$$y = 12x + 8$$

$$y = 12(10) + 8$$

10. Jerami is going to deposit an equal amount of money into a checking account each month until he has saved \$2,000. The amount of money, y , in the account after x months can be modeled by the equation $y = 35x + 250$.

What does the slope of the graph of the equation represent?

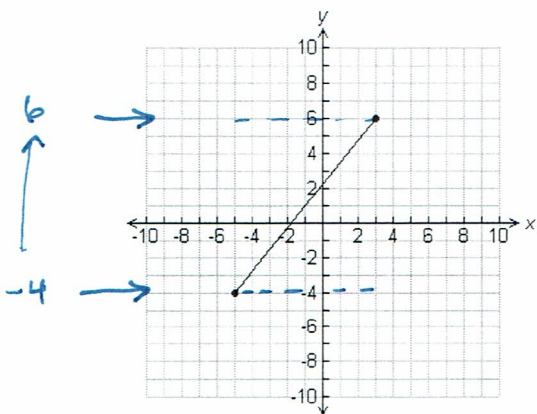
- [A] The amount of money deposited monthly
 [B] The amount of money originally in the account
 [C] The number of months it would take to earn \$250
 [D] The number of months it would take to reach \$2,000

slope y-intercept

$$y = 35x + 250$$

↑ ↑
 amount added to the account each month amount in the account originally

11. Find the range of the function represented in the graph.



- [A] The range consists of values from -5 to 3.
 [B] The range consists of values from -4 to 6.
 [C] The range consists of values from -5 to 6.
 [D] The range consists of values from -4 to 3.

(range) R: North ↑ South
 $[-4, 6]$

(domain) D: West → East
 $[-5, 3]$

12. Which equation represents the line passing through the points (3, 2) and (-9, 6)?

[A] $x - 3y = 9$

[B] $x + 3y = 9$ $\frac{3y}{3} = \frac{-x+9}{3}$

[C] $3x - y = -9$

[D] $3x + y = 9$

$\begin{matrix} x_1, y_1 \\ (3, 2) \end{matrix}$ $\begin{matrix} x_2, y_2 \\ (-9, 6) \end{matrix}$

slope = $\frac{6-2}{-9-3} = \frac{4}{-12} = -\frac{1}{3}$

$2 = -\frac{1}{3}(3) + b$

$2 = -1 + b$ $b = 3$ $y = -\frac{1}{3}x + 3$

13. Which of the following represents the linear equation $3(x+2) = 12 - 2y$ in standard form?

[A] $y = -3/2x + 3$

[B] $y = 3/2x - 3$

[C] $3x - 2y = 10$

[D] $3x + 2y = 6$

$3(x+2) = 12 - 2y$

$3x + 6 = 12 - 2y$
 $-6 \quad -6$

$3x = 6 - 2y$
 $+2y \quad +2y$

$3x + 2y = 6$