

ANSWERS

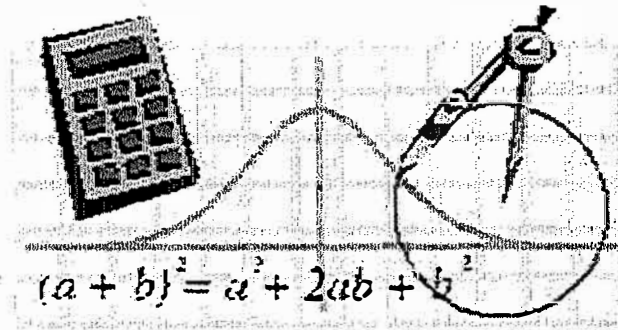
Downingtown High School

East/West

Keystone Algebra 1 Review

Module 1

Linear Equations



1. Blade-Z manufactures roller blades. The production facility has fixed costs of \$300 a day and total production costs of \$3,300 per day at an output of 100 pair of skates per day. Which of the following equations represents the daily production cost for Blade-Z based on the number of skates manufactured?

(Let $C(x)$ represent the daily production cost and x represent the number of pairs of skates manufactured.)

A. $C(x) = 33x + 300$

B. $C(x) = 30x - 300$

C. $C(x) = 30x + 300$

D. $C(x) = 33x$

$$C(x) = mx + b$$

$$3300 = m(100) + 300$$

$$\begin{array}{r} 3300 \\ - 300 \\ \hline 3000 = 100m \\ \frac{3000}{100} = \frac{100m}{100} \end{array}$$

fixed cost
↓

$$30 = m \quad C(x) = 30x + 300$$

* or you could substitute 100 in for x in each answer to see which = \$3300

2. Meghann is completing her chemistry and geometry homework. Each chemistry assignment has x problems, and each geometry assignment has y problems. She must complete a total of 81 problems. The equation below describes the relationship between the number of chemistry problems and the number of geometry problems.

$$5x + 3y = 81$$

Chem geo

$$5 \cdot 9 + 3 \cdot 12 = 81$$

$$45 + 36 = 81$$

Chem geo

The ordered pair (9, 12) is a solution of the equation. What does the solution (9, 12) represent?

- A. Each chemistry assignment contains 9 problems and each geometry assignment contains 12 problems.
- B. Meghann must complete 3 more geometry assignments than chemistry assignments.
- C. Meghann must spend 9 minutes on her chemistry homework and 12 minutes on her geometry homework.
- D. Meghann must complete 9 more chemistry assignments than geometry assignments.

3. A rental car company charges a base fee of $\$50.47$ plus $\$0.50$ per mile driven. If x represents the number of miles driven, which of the following equations could be used to find y , the total cost of the bill?

fixed so y-intercept
changes 40 m

$$y = mx + b$$

$$y = .50x + 50.47$$

- A. $\$0.80x + \$50. y = 47$
 B. $y = \$50.47x + \0.50
 C. $y = \$50.97x$
 D. $y = \$0.50x + \50.47

4. Solve for x . $9x - 5 = 6x + 9x + 10$

A. $x = \frac{5}{18}$

B. $x = -\frac{5}{18}$

C. $x = \frac{5}{2}$

D. $x = -\frac{5}{2}$

$$9x - 5 = 6x + 9x + 10$$

$$9x - 5 = 15x + 10$$

$$\begin{array}{r} -15x \\ \hline -6x - 5 = 10 \\ \quad +5 \quad +5 \\ \hline -6x = 15 \\ \quad -6 \quad -6 \\ \hline x = \frac{15}{-6} = -\frac{5}{2} \end{array}$$

5. The steps John used to solve an equation are shown below.

Solve: $0.4x + 5 + 0.2x = 17$

Step 1: $0.4x + 0.2x + 5 = 17$

order changed so commutative.

Step 2: $0.6x + 5 = 17$

Step 3: $0.6x = 12$

subtract 5 from both sides to get 12

Step 4: $x = 20$

Which properties justify Step 1 and Step 3?

- A. Step 1: Distributive Property
 Step 3: Division Property of Equality
 B. Step 1: Distributive Property
 Step 3: Subtraction Property of Equality
 C. Step 1: Commutative Property of Equality
 Step 3: Division Property of Equality
 D. Step 1: Commutative Property of Addition
 Step 3: Subtraction Property of Equality

6. What is a solution to the linear equation $\frac{3}{4}x - 5 = 10$

A. $x = \frac{15}{4}$

B. $x = \frac{20}{3}$

C. $x = \frac{45}{4}$

D. $x = 20$

$$\frac{3}{4}x - 5 = 10$$

$$\frac{3}{4}x = 15$$

$$x = \frac{60}{3} = 20$$

7. Which is a correct step in solving the following equation for x?

$$-1.75 + 2(2 - x) = 0$$

A. $2(2 - x) = -1.75$

B. $-2x = 1.75 - 4$

C. $4 - x = 1.75$

D. $x = -2.25 \div 2$

$$-1.75 + 4 - 2x = 0$$

$$2.25 - 2x = 0$$

8. Use elimination to find the solution to the system of equations.

$$5x + y = 10$$

$$2x - 3y = 4$$

A. $x = 14, y = 8$

B. $x = 2, y = 0$

C. $x = -4, y = 4$

D. $x = -4, y = 30$

$$\begin{array}{r} (5x + y = 10) \cdot 3 \\ 2x - 3y = 4 \end{array}$$

$$15x + 3y = 30$$

$$2x - 3y = 4$$

$$\hline 17x = 34$$

$$x = 2$$

9. Use substitution to solve for x in the system of equations.

$$11x + 2y = 30$$

$$4x + y = 9$$

A. $x = 4$

B. $x = 10$

C. $x = -4$

D. $x = 8$

$$\begin{array}{r} 4x + y = 9 \\ -4x = -4x \end{array}$$

$$y = 9 - 4x$$

$$11x + 2(9 - 4x) = 30$$

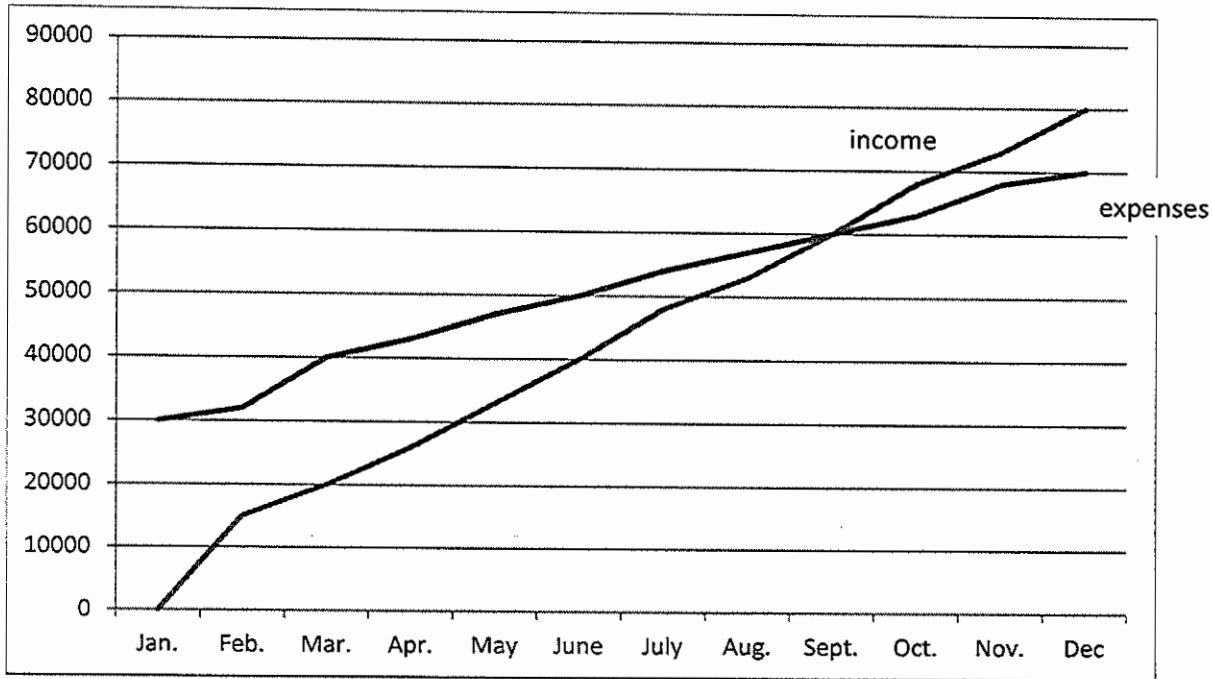
$$11x + 18 - 8x = 30$$

$$3x + 18 = 30$$

$$\hline 3x = 12$$

$$x = 4$$

10. The equations representing income and expenses for Tom's candy store are shown in the graph below.



$$\text{Income: } 20,000x - 3y = 0$$

$$\text{Expenses: } 10,000x - 3y + 90,000 = 0$$

Let x represent the month and y represent the amount in dollars. In which month were the store's expenses greater than its income?

- A. November
B. September

C. August

D. October

$$\begin{array}{r} 20000x - 3y = 0 \\ -(10000x - 3y = -90000) \\ \hline -10000x + 3y = 90000 \end{array}$$

$$\frac{10000x}{10000} = \frac{90000}{10000}$$

Solve by elimination

$x = 9$ at 9th month expenses + income are same. after Sept., income gets larger, so August is highest for expenses

11. Reid and Sharon work in two different clothing stores. Reid's store sells shirts for \$14 each and pants for \$39 each. Sharon's store sells shirts for \$12 each and pants for \$44 each.

One day, Reid sold \$145 worth of shirts and pants, and Sharon sold the same number of shirts and pants, but her sales were worth \$156. When x is the number of shirts sold and y is the number of pants sold, the situation can be modeled by a system of linear equations.

$$\begin{aligned} x &= \text{shirts} \\ y &= \text{pants} \end{aligned}$$

- A. Write the two equations that form the system of equations which models the information above.

Equations: $14x + 39y = 145$ $12x + 44y = 156$

- B. Use the equations found in Part A to determine how many shirts and pants Reid sold.

$$\begin{array}{r} 6(14x + 39y = 145) \rightarrow 84x + 234y = 870 \\ -7(12x + 44y = 156) \rightarrow -84x - 308y = -1092 \\ \hline -74y = -222 \\ \frac{-74y}{-74} = \frac{-222}{-74} \\ y = 3 \text{ (pants)} \end{array}$$

$$\begin{array}{r} 14x + 39(3) = 145 \\ 14x + 117 = 145 \\ \underline{-117 \quad -117} \\ 14x = 28 \\ \frac{14x}{14} = \frac{28}{14} \\ x = 2 \text{ shirts} \end{array}$$

Shirts: 2

Pants: 3

C. On another day, Reid and Sharon each sold 5 shirts and 2 pants. Who sold the greatest dollar amount of merchandise? Write an equation and explain your answer.

$$x = \text{shirts}$$
$$y = \text{pants}$$

$$\begin{aligned} \text{Reid} &\rightarrow 14x + 39y \\ &14(5) + 39(2) \\ &70 + 78 \\ &\$148 \end{aligned}$$

$$\begin{aligned} \text{Sharon} &12x + 44y \\ &12(5) + 44(2) \\ &60 + 88 \\ &\$148 \end{aligned}$$

They sold the same amount of \$148