

Name: SOLUTIONS

Date: _____

MidYear Review

Systems of Equations 07

Systems of Equations (Word Problems)

1. Which of the following statements about the system of equations below is true?

Eq. 1) $\frac{3y}{3} = \frac{6x}{3} + \frac{24}{3}$

$y = 2x + 8$

Eq. 2) $2y - 4x - 16 = 0$
 $+4x + 16 \quad +4x + 16$

$\frac{2y}{2} = \frac{4x + 16}{2}$
 $y = 2x + 8$

- A) The system has **one** unique solution
- B) The system has **two** unique solutions
- C) The system has **no** solutions
- D) The system has an **infinite** number of solutions**

Same equation, same line, right on top of each other. These lines have infinite solutions (points where they touch)

Answer: D

2. Eq. 1) $\frac{3y}{3} = \frac{45x}{3} + \frac{180}{3}$

$y = 15x + 60$

Eq. 2) $\frac{2y}{2} = \frac{26x}{2} + \frac{160}{2}$

$y = 13x + 80$

What is the solution to the above system of equations?

$y = 15(10) + 60$
 $y = 150 + 60$
 $y = 210$

$15x + 60 = 13x + 80$
 $\underline{-13x} \quad \underline{-13x}$
 $2x + 60 = 80$
 $\underline{-60} \quad \underline{-60}$
 $\frac{2x}{2} = \frac{20}{2}$

$x = 10$

$y = 13(10) + 80$
 $y = 130 + 80$
 $y = 210$

Answer: The solution to the system of equations is: (10 , 210)

3. The price list has been lost from the school cafeteria.

Yesterday, **2 milk boxes** and **3 muffins** cost a student \$ **3.25**

Today, **5 milk boxes** and **2 muffins** cost that same student \$ **4.00**

What is the **cost** of a milk box? "x" is the cost of a milk

What is the **cost** of a muffin? "y" is the cost of a muffin

How much will it cost tomorrow if that student buys **4 milks** and **4 muffins**?

$$\begin{array}{r} 2x + 3y = 3.25 \\ -2x \qquad | \quad -2x \\ \hline \end{array}$$

$$\frac{3y}{3} = \frac{-2x + 3.25}{3}$$

$$y = -0.\bar{6}x + 1.08\bar{3}$$

$$\begin{array}{r} 5x + 2y = 4 \\ -5x \qquad | \quad -5x \\ \hline \end{array}$$

$$\frac{2y}{2} = \frac{-5x + 4}{2}$$

$$y = -2.5x + 2$$

$$y = -0.\bar{6}(0.50) + 1.08\bar{3}$$

$$y = -0.\bar{3} + 1.08\bar{3}$$

$$y = 0.75$$

$$\begin{array}{r} -0.\bar{6}x + 1.08\bar{3} = -2.5x + 2 \\ +2.5x \qquad \qquad \qquad +2.5x \\ \hline \end{array}$$

$$1.8\bar{3}x + 1.08\bar{3} = \qquad \qquad \qquad 2$$

$$\frac{1.8\bar{3}x}{1.8\bar{3}} = \frac{0.91\bar{6}}{1.8\bar{3}}$$

$$x = 0.5$$

$$y = -2.5(0.50) + 2$$

$$y = -1.25 + 2$$

$$y = 0.75$$

4 milks and 4 muffins

$$4(0.50) + 4(0.75) = ?$$

$$2.00 + 3.00 = ?$$

5.00

Answer: A milk box costs: \$ 0.50

Answer: A muffin costs: \$ 0.75

Answer: The cost will be \$ 5.00 to buy 4 of each.

4. Dan got a job at *Footlocker* selling **shoes** and **shirts**.
He kept a record of his sales in a table but spilled coffee on it and lost some of the data.

| | Shirts | | Shoes | | Total sales (\$) |
|-------|--------|---|--------|---|------------------|
| Day 1 | 3 x | + | 12 y | = | 1770 |
| Day 2 | 18 x | + | 6 y | = | 1380 |
| Day 3 | $? x$ | + | 10 y | = | 1760 |

How many shirts did he sell on day 3?

$$\text{Day 1: } 3x + 12y = 1770$$

$$\begin{array}{r} -3x \\ \hline \end{array} \quad \begin{array}{r} 12y \\ \hline \end{array} \quad \begin{array}{r} -1770 \\ \hline \end{array}$$

$$\frac{12y}{12} = \frac{-3x + 1770}{12}$$

$$y = -0.25x + 147.50$$

$$y = -0.25x + 147.50$$

$$y = -0.25(30) + 147.50$$

$$y = -7.50 + 147.50$$

$$y = 140$$

$$\text{Day 2: } 18x + 6y = 1380$$

$$\begin{array}{r} -18x \\ \hline \end{array} \quad \begin{array}{r} 6y \\ \hline \end{array} \quad \begin{array}{r} -1380 \\ \hline \end{array}$$

$$\frac{6y}{6} = \frac{-18x + 1380}{6}$$

$$y = -3x + 230$$

$$-0.25x + 147.50 = -3x + 230$$

$$\begin{array}{r} +3x \\ \hline \end{array}$$

$$\begin{array}{r} +3x \\ \hline \end{array}$$

$$2.75x + 147.50 = 230$$

$$\begin{array}{r} -147.50 \\ \hline \end{array}$$

$$\begin{array}{r} -147.50 \\ \hline \end{array}$$

$$\frac{2.75x}{2.75} =$$

$$\frac{82.50}{2.75}$$

$$x = 30$$

DAY 3

$$?(30) + 10(140) = 1760$$

$$\begin{array}{r} ?(30) + 1400 = 1760 \\ -1400 \quad -1400 \\ \hline \end{array}$$

$$\begin{array}{r} ?(30) = 360 \\ \hline 30 \end{array}$$

$$? = 12$$

Answer: On day 3, Dan sold 12 shirts.