

Systems Pre-Assessment (NOT GRADED)

Name: _____

1. a. You buy 10 hot dogs and 2 hamburgers for \$40. Your friend buys 2 hot dogs and 2 hamburgers for \$16. Write a system of equations to represent this situation. Define your variables.

Let x = price of hot dog
 y = price of hamburger

$$\begin{aligned} 10x + 2y &= 40 \\ (2x + 2y &= 16) \end{aligned}$$

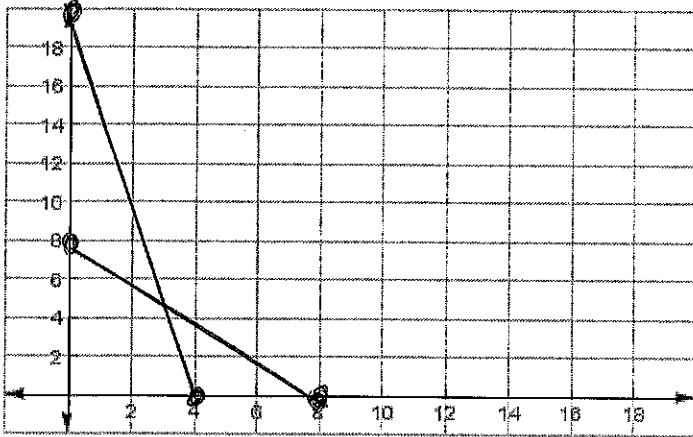
$$\frac{8x}{8} = \frac{24}{8} \rightarrow x = 3$$

$$2(3) + 2y = 16$$

$$6 + 2y = 16$$

$$\begin{array}{r} -6 \\ -6 \end{array} \quad 2y = 10 \rightarrow y = 5$$

- b. Graph both equations on the graph below.



- c. Where do the two lines intersect? $(3, 5)$

- d. What would be the cost of 3 hot dogs and 5 hamburgers?

$$3(3) + 5(5) = 9 + 25 = 34$$

- 2a. I start with 20 pieces of swag and lose 3 pieces every day. My brother starts with 0 pieces and gains 2 every day. Write a system of equations to represent this situation. Define your variables.

Let y = # of pieces of swag
 x = # of days

$$y = 20 - 3x$$

$$y = 0 + 2x$$

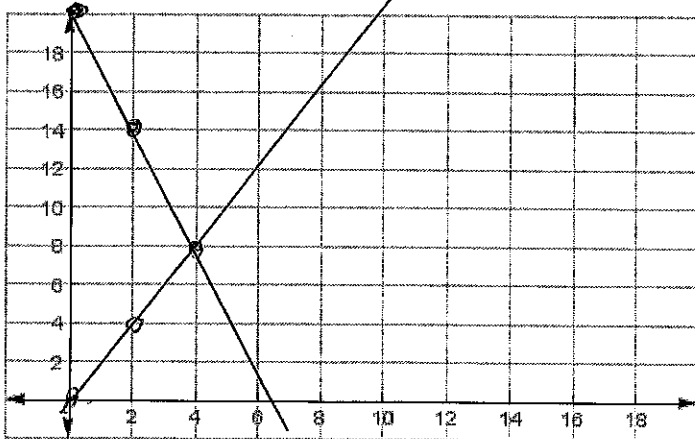
$$\begin{array}{r} 20 - 3x = 0 + 2x \\ +3x \quad \quad +3x \end{array}$$

$$\frac{20}{5} = \frac{5x}{5} \rightarrow 4 = x$$

$$y = 20 - 3(4) = 20 - 12 = 8.$$

$$y = 0 + 2(4) = 8.$$

- b. Graph both equations on the graph below.



- c. Where do the two lines intersect? $(4, 8)$

- d. When will my brother have twice as much swag as me?

Day 5. (10 vs 5)

Solve each system of equations for X AND Y. Use any method.

3. $y = 6x - 13$
 $y = -12x + 23$

$$\begin{array}{r} 6x - 13 = -12x + 23 \\ +12x \quad +12x \\ \hline 18x - 13 = 23 \\ +13 \quad +13 \\ \hline 18x = 36 \rightarrow x = 2 \end{array}$$

$$\begin{array}{l} y = 6(2) - 13 \\ y = 12 - 13 \\ y = -1 \\ -1 \stackrel{?}{=} -12(2) + 23 \\ -1 = -24 + 23 \end{array}$$

4. $y = 17 - 3x$
 $y = -2x + 11$

$$\begin{array}{r} 17 - 3x = -2x + 11 \\ +3x \quad +3x \\ \hline 17 = x + 11 \\ -11 \quad -11 \\ \hline 6 = x \end{array}$$

$$\begin{array}{l} y = 17 - 3(6) \\ y = 17 - 18 \\ y = -1 \\ -1 \stackrel{?}{=} -2(6) + 11 \\ -1 = -12 + 11 \end{array}$$

5. ~~$4x + 3y = 3$~~
 ~~$5y - 4x = 37$~~

Rewrite: $4x + 3y = 3$
 $-4x + 5y = 37$
 $8y = 40$

$y = 5$

$$\begin{array}{l} 4x + 3(5) = 3 \\ 4x + 15 = 3 \\ 4x = -12 \\ x = -3 \end{array}$$

6. $4(3x + 5y = 1)$
 $3(4x + 7y = 0)$

$$\begin{array}{r} 12x + 20y = 4 \\ 12x + 21y = 0 \\ \hline -1y = 4 \\ \frac{-1}{-1} \quad \frac{4}{-1} \\ \hline y = -4 \end{array}$$

$$\begin{array}{l} 3x + 5(-4) = 1 \\ 3x - 20 = 1 \\ 3x = 21 \\ x = 7 \end{array}$$

7. You're going to a basketball game with a student discount. If 6 students and 4 adults go, it will cost \$216. If 5 students and 8 adults go, it will cost \$306.

- Find the cost of a student ticket.
- Find the cost of an adult ticket.
- If 8 students and 3 adults go, how much will it cost?

Let $x = \text{cost of student}$, $y = \text{cost of adult}$
 Remember to define your variables and to verify your solution.

$$\begin{array}{r} 2. \quad (6x + 4y = 216) \cdot 2 \\ 5x + 8y = 306 \\ \hline 12x + 8y = 432 \leftarrow \end{array}$$

$$\begin{array}{r} 7x = 126 \\ \frac{7}{7} \quad \frac{7}{7} \\ \hline x = 18 \end{array}$$

$$\begin{array}{l} 6(18) + 4y = 216 \\ 108 + 4y = 216 \\ 4y = 108 \\ \frac{4}{4} \quad \frac{108}{4} \\ \hline y = 27 \end{array}$$

$$\begin{array}{l} 5(18) + 8(27) \stackrel{?}{=} 306 \\ 90 + 216 = 306 \checkmark \end{array}$$

Students cost 18, adults cost 27.

8 students & 3 adults cost $8(18) + 3(27) = 144 + 81 = 225$.