

Linear Systems

1. Which system has exactly one solution?

A.  $y = -4x - 2$   
 $y = -4x + 5$   
 $m = -4$   
 no soln // lines

B.  $6x - 3y = -1$   
 $-2x + y = 4$

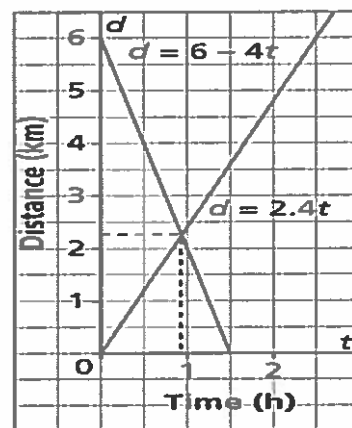
$6x + 1 = 3y$   
 $2x + \frac{1}{3} = y$   
 $y = 2x + 4$   
 $m = 2$   
 no soln // lines

C.  $\frac{1}{3}x + \frac{1}{2}y = 2$   
 $\frac{1}{6}x + y = \frac{5}{2}$   
 $\frac{1}{2}y = -\frac{1}{3}x + 2$   
 $y = -\frac{2}{3}x + 4$   
 $y = -\frac{1}{6}x + \frac{5}{2}$   
 1 soln

D.  $y = 3x - 2$   
 $y = 3x + 2$   
 $m = 3$   
 no soln // lines

2. What is the solution to the system graphed?

$(0.9, 2.3)$



3. What is the solution to the system of equations  $\begin{cases} y = 2x - 1 \\ y = -x + 5 \end{cases}$

$(2, 3)$

$$\begin{array}{r} 2x - 1 = -x + 5 \\ +x \qquad \qquad +x \\ \hline 3x - 1 = 5 \\ +1 \qquad +1 \\ \hline 3x = 6 \\ \frac{3x}{3} = \frac{6}{3} \\ x = 2 \end{array}$$

$y = 2(2) - 1$   
 $y = 4 - 1$   
 $y = 3$

4. In which system of equations are the equations parallel?

A.  $\begin{cases} 2x - y = 3 \\ x + 2y = 3 \end{cases}$

$2x - 3 = y$   
 $2y = -x + 3$   
 $y = -\frac{1}{2}x + \frac{3}{2}$   
 not //

B.  $\begin{cases} x - y = 10 \\ x + y = 10 \end{cases}$

$x - 10 = y$   
 $y = -x + 10$   
 not //

C.  $\begin{cases} 2x + 3y = 5 \\ 6x + 9y = 1 \end{cases}$

$3y = -2x + 5$   
 $y = -\frac{2}{3}x + \frac{5}{3}$   
 $9y = -6x + 1$   
 $y = -\frac{2}{3}x + \frac{1}{9}$   
 //  
 $m = -\frac{2}{3}$

D.  $\begin{cases} y = 3x - 1 \\ y = -3x + 2 \end{cases}$

not //

5. Solve each linear system algebraically.

a)  $-3x - 6y = 9$   $2x + 2y = -4$   $x^2$   
 b)  $3x - 4y = 13$   $5x + 3y = 12$   $x^3$   
 c)  $\frac{1}{2}x - \frac{1}{3}y = \frac{5}{12}$   $x12$   
 $\frac{5}{6}x + \frac{1}{2}y = \frac{1}{6}$   $x6$

a)  $-6x - 12y = 18$   
 $6x + 6y = -12$   


---

 $-6y = 6$   
 $y = -1$

$2x + 2(-1) = -4$   
 $2x - 2 = -4$   
 $2x = -2$   
 $x = -1$

$(-1, -1)$

$9x - 12y = 39$   
 $20x + 12y = 48$   


---

 $29x = 87$   
 $x = 3$

$5(3) + 3y = 12$   
 $15 + 3y = 12$   
 $3y = -3$   
 $y = -1$

$(3, -1)$

$6x - 4y = 5$  (x3)

$5x + 3y = 1$  (x4)

$18x - 12y = 15$

$20x + 12y = 4$

$38x = 19$

$x = \frac{1}{2}$

$\frac{1}{2}(\frac{1}{2}) - \frac{1}{3}y = \frac{5}{12}$

$(\frac{1}{2}, -\frac{1}{2})$

$\frac{1}{4} - \frac{1}{3}y = \frac{5}{12}$  (x12)

$3 - 4y = 5$

$-4y = 2$   $y = -\frac{1}{2}$

6. a) Write a linear system to model this situation:

Every time Joe goes to the cafeteria he buys a soup for \$1.75 or pizza for \$4.75. During the year he spent \$490 and bought 160 food items.

b) How many of each item did he buy? Solve this problem algebraically.

$s + p = 160$

$p = 160 - s$

$1.75s + 4.75p = 490$

$1.75s + 4.75(160 - s) = 490$

$1.75s + 760 - 4.75s = 490$

$-3s = -270$

$s = 90$

$p = 160 - 90 = 70$

90 soup

70 pizza.

7. Solve the system by graphing.

$2x + y = -3$

$y = -2x - 3$

$3x - 2y = 2$

$-2y = -3x + 2$

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

