

1. Which linear system has the solution  $x = -2$  and  $y = 6$ ?

- ~~a.~~  $x + 3y = 17$
- $2x + y = 15$
- ~~b.~~  $2x + y = -2$
- $x + y = 16$

- c.  $x + 3y = 16$
- $4x + 4y = 16$
- ~~d.~~  $x + 2y = -2$
- $2x + 4y = -4$

*Put values into calc to see which work*

2. Create a linear system to model this situation:

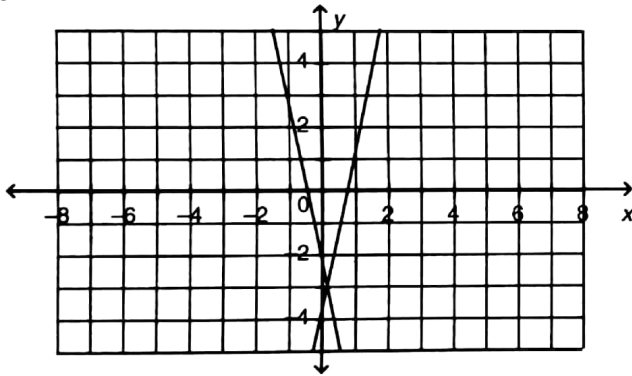
Cheri operates a grass-cutting business. She charges \$19 for a small lawn and \$29 for a large lawn. One weekend, Cheri made \$287 by cutting 13 lawns.

- ~~a.~~  $s + l = 287$
- $29s + 19l = 13$
- ~~b.~~  $s + l = 287$
- $19s + 29l = 13$

- $19s$
- $29l$
- ~~c.~~  $s + l = 13$
- $29s + 19l = 287$
- d.  $s + l = 13$
- $19s + 29l = 287$

3. Use the graph to approximate the solution of the linear system:

$y = -5x - 2$   
 $y = 5x - 4$



- ~~a.~~ (0, -2.8)
- ~~b.~~ (-3, 0.2)

- c. (0.2, -3)
- ~~d.~~ (-2.8, 0)

4. Express each equation in slope-intercept form.

$-2x + 4y = 68 \rightarrow 4y = \frac{2x}{4} + \frac{68}{4}$

$\rightarrow y = \frac{1}{2}x + 17$

$13x + 4y = 284 \rightarrow 4y = -\frac{13x}{4} + \frac{284}{4}$

$y = -\frac{284}{13}x + 17$

$y = \frac{13}{4}x + 71$

$y = -\frac{13}{4}x + \frac{4}{13}$

- b.  $y = \frac{1}{2}x + 17$

~~d.~~  $y = \frac{4}{13}x - \frac{284}{13}$

$y = -\frac{13}{4}x + 71$

$y = \frac{1}{2}x - \frac{284}{13}$



11. Determine the number of solutions of the linear system:

$$2x - 5y = 23$$

$$-6x + 15y = 21$$

$$\rightarrow \frac{-5y}{-5} = \frac{-2x + 23}{-5} \rightarrow y = \frac{2}{5}x - \frac{23}{5}$$

$$\rightarrow \frac{15y}{15} = \frac{6x + 21}{15} \rightarrow y = \frac{2}{5}x + \frac{7}{5}$$

$$y = \frac{2}{5}x - \frac{23}{5}$$

$$y = \frac{2}{5}x + \frac{7}{5}$$

parallel

- a. two solutions  
 b. no solution

- c. infinite solutions  
 d. one solution

### Constructed Response

1. Create a linear system to model each situation:

- a) In a board game, Judy scored 3 points more than twice the number of points Ann scored. There was a total of 39 points scored.

- b) A recycling depot pays 0.06¢ for a small can and 0.23¢ for a large can. Chara took 70 cans to the recycling depot and her total refund was \$22.35.

S → small can    l → large can

$$S + l = 70$$

$$0.06S + 0.23l = 22.35$$

2. Solve this linear system by graphing.

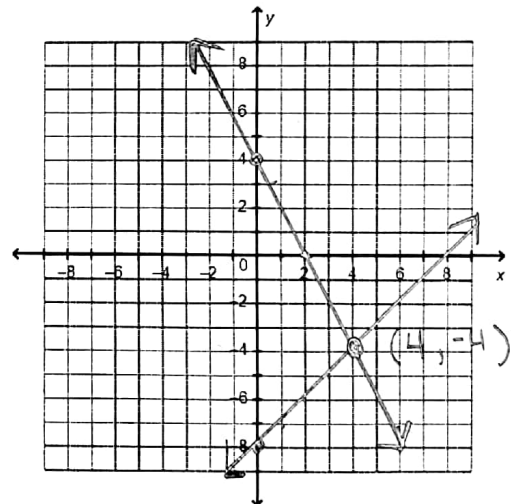
$$2y + 4x = 8$$

$$-x + y = -8$$

$$y = x - 8$$

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

$$y = -2x + 4$$



3. Use substitution to solve this linear system.

$$8x + y = -458$$

$$-5x + 3y = 221$$

$$\rightarrow y = -8x - 458$$

$$-5x + 3(-8x - 458) = 221$$

$$-5x - 24x - 1374 = 221$$

$$\rightarrow -29x = 221 + 1374$$

$$\frac{-29x}{-29} = \frac{1595}{-29}$$

$$x = -55$$

$$8(-55) + y = -458$$

$$y = -458 + 440$$

$$y = -18$$

4. Create a linear system to model the following situation, and then use substitution to solve the problem: The perimeter of a rectangular field is 276 m. The length is 18 m longer than the width. What are the dimensions of the field?

5. Use an elimination strategy to solve each linear system. Verify your solutions.

a)  $4x - 3y = 10$

$(2x + 5y = 18)^{-2}$

$$\begin{array}{r} 4x - 3y = 10 \\ + -4x - 10y = -36 \\ \hline -13y = -26 \\ -13 \quad -13 \end{array}$$

$y = 2$

$2x + 5(2) = 18$   
 $2x = 8$   
 $x = 4$

b)  $\left(\frac{2}{3}x + \frac{1}{7}y = -11\right)^{21}$   
 $\left(\frac{1}{7}x - \frac{1}{3}y = -10\right)^{21}$

$\rightarrow \begin{pmatrix} 14x + 3y = -231 \\ 3x - 7y = -210 \end{pmatrix}^3$

$$\begin{array}{r} 98x + 21y = -1617 \\ + 9x - 21y = -630 \\ \hline 107x = -2247 \\ \frac{107x}{107} = \frac{-2247}{107} \\ x = -21 \end{array}$$

6. Create a linear system to model this situation, then solve.

Tickets for a school play cost \$8 for adults and \$4.75 for students.

There were ten more student tickets sold than adult tickets, and a total of \$1399 in ticket sales was collected.

a - adults s - students

$8a + 4.75s = 1399$   
 $a + 10 = s$

$8a + 4.75(a + 10) = 1399$   
 $8a + 4.75a + 47.5 = 1399$

$a + 10 = s$   
 $106 + 10 = s$   
 $116 = s$

$12.75a = 1351.5$   
 $\frac{12.75a}{12.75} = \frac{1351.5}{12.75}$

$a = 106$

7. Determine the number of solutions, if any, of this linear system. How would the graphs of these equations confirm your answer?

$4x + 12y = 28$   
 $8x + 24y = 48$

$\rightarrow \frac{12y}{12} = \frac{-4x + 28}{12}$   
 $y = -\frac{1}{3}x + \frac{7}{3}$

$\frac{24y}{24} = \frac{-8x + 48}{24}$

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

No solution!  
 lines are parallel

8. For what value of k does the linear system below have infinite solutions?

$\frac{4}{5}x + y = 14 \rightarrow y = -\frac{4}{5}x + 14$

$kx + 2y = 28$

$\rightarrow 2y = -kx + 28$

$y = -\frac{k}{2}x + 14$

$-\frac{4}{5} = -\frac{k}{2}$

$\frac{8}{5} = k$