Algebra

Review - Chapter 7

Solve each system by graphing.

1) \(2x + 7y = -49\)
   \(2x + 7y = 49\)

2) \(x + 2y = 14\)
   \(4x - y = 2\)

3) \(3x - y = 9\)
   \(3x - y = -1\)

4) \(11x - 4y = -32\)
   \(x + y = -7\)

Use a graph to solve the system. Use a separate sheet of graph paper.

5) Josh wrote a business plan for an entrepreneurship class, and now he has to make bound copies. Josh could use a printer who charges a setup fee of $50 and $5 for every copy printed. Another possibility is to go to the office supply store, where he could pay an up-front fee of $30 and $7 per copy. There is a certain number of copies that makes the two options equivalent in terms of cost. How much would the copies cost?

   a. Write a linear system. Let \(x\) be the amount of copies and let \(y\) be the amount Josh spent.
\[ y = 50 + 5x \]
\[ y = 30 + 7x \]

or \[ y = 30 + \frac{35}{5} x \]

Still equals 7, but fits my scale better.

(10, 100)

The copies would cost $100.
Solve each system by substitution.

6) \[ y = 5x - 16 \]
   \[ y = 4x - 13 \]
   \((3, -1)\)

7) \[ y = -6x - 7 \]
   \[ y = -7x - 8 \]
   \((-1, -1)\)

8) \[ y = -2x - 13 \]
   \[-x + 5y = -10 \]
   \((-5, -3)\)

9) \[ y = 4x + 7 \]
   \[-12x + 3y = 21 \]
   Infinite Solutions

10) \[-5x + y = -22 \]
    \[4x - 5y = 5 \]
     \((-5, -3)\)

11) \[ 5x - 4y = 8 \]
    \[-5x + y = -2 \]
     \((0, -2)\)

12) \[-7x - y = -7 \]
    \[7x + y = -7 \]
    No Solution

13) \[ x - y = -12 \]
    \[7x + 2y = -12 \]
    \((-4, 8)\)

14) \[-x + 2y = -11 \]
    \[-8x + 5y = -22 \]
    \((-1, -6)\)

15) \[ 12x - 12y = 4 \]
    \[-4x + 4y = -5 \]
    No solution
16) \(4x + 7y = 21\)
\[-3x + 2y = -23\]
\((-7, -1)\)

17) \(-4x - y = 8\)
\[-4x + 3y = 8\]
\((-2, 0)\)

Use substitution to solve the word problem.

18) Long-sleeve and short-sleeve T-shirts can be purchased at a concert. A long-sleeve T-shirt costs $25 and a short-sleeve T-shirt costs $15. During a concert, the T-shirt vendor collects $8415 from the sale of 441 T-shirts. How many short sleeve T-shirts were sold?

\[
25L + 15S = 8415
\]
\[
L + S = 441
\]

\[
\text{Short} = 261
\]
\[
\text{Long} = 180
\]

Solve each system by elimination.

19) \(3x + 2y = 1\)
\[-4x - 2y = 4\]
\((-5, 8)\)

20) \(-4x + 7y = 16\)
\[4x + 3y = 24\]
\((3, 4)\)

21) \(-2x - 10y = -16\)
\[-2x + y = -5\]
\((3, 1)\)

22) \(-5x - 3y = 18\)
\[-5x - 3y = 18\]
\[\text{Infinite Solutions}\]

23) \(3x - 3y = -3\)
\[10x - 9y = -10\]
\((-1, 0)\)

24) \(-x + 2y = -16\)
\[-3x - y = -6\]
\((4, -6)\)
25) \(8x - 3y = -24\)  
\(4x - 6y = -12\)  
\((-3, 0)\)

26) \(4x - 2y = 4\)  
\(-x + 10y = 18\)  
\((2, 2)\)

27) \(-15x + 10y = 5\)  
\(18x - 12y = -12\)  
\(\text{No Solution}\)

28) \(16x + 16y = -16\)  
\(10x + 10y = -10\)  
\(\text{Infinite Solution}\)

29) \(-14x - 7y = 0\)  
\(16x + 8y = 0\)  
\((0, 0)\)

30) \(9x - 10y = -8\)  
\(-8x - 3y = 19\)  
\((-2, -1)\)

Use elimination to solve the following word problem.

31) The sum of two numbers is \(-27\). The difference between the two numbers is \(-9\). What are the two numbers.

\[
\begin{align*}
\text{(I)} & \quad n + m = -27 \\
\text{(II)} & \quad n - m = -9
\end{align*}
\]

\[
\begin{align*}
n & = -18 \\
m & = -9
\end{align*}
\]

32) Which ordered pair is a solution of the linear system \(5x + 3y = 22\) and \(4x - 3y = -4\)?

A) \((5, -1)\)  
B) \((2, 4)\)  
C) \((-1, 0)\)  
D) \((8, -6)\)

33) Which ordered pair is a solution of the system \(x + 2y \leq -2\) and \(y \leq -3x + 4\)?

A) \((0, 0)\)  
B) \((-2, 2)\)  
C) \((2, -2)\)  
D) \((5, -4)\)
Sketch the solution to each system of inequalities.

34) \( y < 10x - 3 \)
    \( y \geq -x + 8 \)

35) \( y \leq 8 \)
    \( y \geq 2x - 2 \)

36) \( 9x - 8y \geq -64 \)
    \( x + 2y > -10 \)

37) \( x + 2y < 8 \)
    \( 7x - 4y > 20 \)