

5-Minute Check

Solve by graphing and describe your solution to the following system:

$$2x + 3y = 6$$

$$3x - 4y = -4$$

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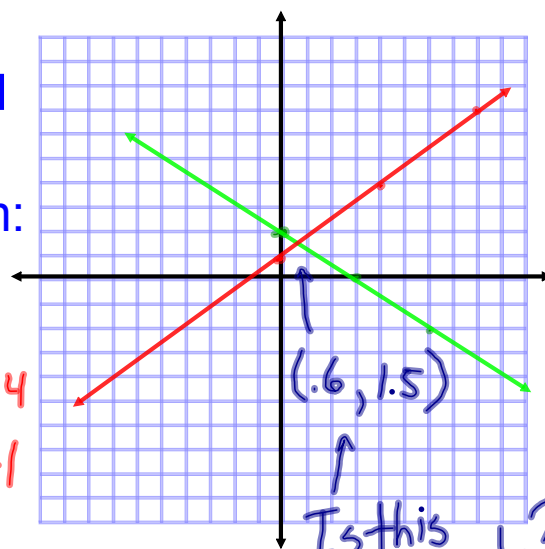
$$3x - 4y = -4$$

$$3y = -2x + 6$$

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

$$-4y = -3x - 4$$

$$y = \frac{3}{4}x + 1$$



Is this accurate?

5-min solution

3-2 Solving Systems of Equations Algebraically

Objective: Be able to solve systems of equations utilizing algebra

3-2

2 Algebraic Methods:

Substitution-

solve for one variable

plug that information into the other equation to allow you to solve for a variable

Elimination-

arrange the equations so that they are in the same format

then multiply where needed so that the equations have one variable w/ opposite coefficients

then add them up to solve for one of the variables

methods to solve

Example 1:

Solve using the elimination method:

$$7x - 4y = -1 \leftarrow 5$$

$$3x + 5y = 13 \leftarrow 4$$

$$\begin{array}{r} 35x - 20y = -5 \\ + 12x + 20y = 52 \\ \hline 47x = 47 \\ \hline x = 1 \end{array}$$

$$\begin{array}{l} 3 + 5y = 13 \\ 5y = 10 \\ y = 2 \end{array}$$

(1, 2)
Consistent
Indep.

ex 1

Example 2:

Solve by substitution

$$6a - 3b = -9$$

$$b = 2a - 8$$

$$6a - 3(2a - 8) = -9$$

$$6a - 6a + 24 = -9$$

$$24 \neq -9$$

$$\emptyset$$

(parallel lines)

Inconsistent

ex 2

Example 3:
Solve by elimination

$$2x - y = 6 \quad \leftarrow 5$$

$$3x + 5y = 22$$

$$\begin{array}{r} 10x - 5y = 30 \\ + 3x + 5y = 22 \\ \hline 13x \qquad = 52 \\ x = 4 \end{array}$$

$$\begin{array}{r} 12 + 5y = 22 \\ 5y = 10 \\ y = 2 \end{array}$$

$(4, 2)$
Consistent
Indep.

ex 3

Example 4:
Solve by substitution:

$$3a - 2b = -3$$

$$3a + b = 3 \Rightarrow b = -3a + 3$$

$$3a - 2(-3a + 3) = -3$$

$$3a + 6a - 6 = -3$$

$$9a - 6 = -3$$

$$9a = 3$$

$$a = \frac{3}{9} = \frac{1}{3}$$

$$b = -3\left(\frac{1}{3}\right) + 3$$

$$b = -1 + 3$$

$$b = 2$$

$$\left(\frac{1}{3}, 2\right)$$

ex 4

Example 5:
Solve using elimination:

$$6x - 4y = 10$$

$$3x - 2y = 5 \leftarrow -2$$

$$\begin{array}{r} 6x - 4y = 10 \\ + \quad -6x + 4y = -10 \\ \hline 0 + 0 = 0 \end{array}$$

(lines are duplicates)
All pts on line.

Consistent
Dep.

ex 5

Example 6:
Solve:

$$.25x + y = 3.5$$

$$1/4 x + y = 7/2$$

$$2x - y = 19 \leftarrow$$

$$\begin{array}{r} 2.25x = 22.5 \\ \hline 2.25 \quad 2.25 \end{array}$$

$$x = 10$$

$$20 - y = 19$$

$$-y = -1$$

$$y = 1$$

(10, 1)
Consistent
Indep.

ex 6

Assignment:
Begin Now!

p.137
6-12, 15-26

Assignment