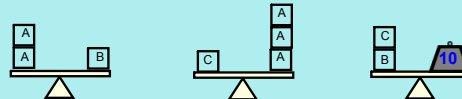


Section 3-5 Systems with 3 Variables

Students will be able to:

- solve systems in 3 variables using substitution
- solve systems in 3 variables using elimination

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How much does each box weigh?

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Solving systems of equations in 3 variables uses the same methods of solving in 2 variables.

- substitution
- elimination - form 2 separate systems in the same variables.

Graph of solutions-iPad

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Solving using Elimination:

$$\begin{cases} x - y + z = -1 \\ x + y + 3z = -3 \\ 2x - y + 2z = 0 \end{cases}$$

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Solve using Elimination:

$$\begin{cases} x - 2y + 3z = 12 \\ 2x - y - 2z = 5 \\ 2x + 2y - z = 4 \end{cases}$$

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Solve:

$$\begin{cases} x - y - 2z = -7 \\ y + z = 1 \\ x = 2y + 3z \end{cases}$$

$$X = 2(5) + 3(-2)$$

$$X = 0$$

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Substitution is the best method to use when you can easily solve for one of the variables.

$$\begin{cases} x + 2y + 3z = 6 \\ y + 2z = 0 \\ z = 2 \end{cases}$$

$(8, -4, 2)$

$$y + 2(2) = 0$$

$$y - 4 = -4$$

$$y = -4$$

$$x + 2(-4) + 3(2) = 6$$

$$x - 8 + 6 = 6$$

$$x - 2 = 6$$

$$x = 8$$

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Solve using Substitution:

$$\begin{cases} x - 2y + z = -4 \\ -4x + y - 2z = 1 \\ 2x + 2y - z = 10 + z \end{cases}$$

$(2, 1, -4)$

$$(2x + 2y - 10) = z$$

$$\begin{cases} ① x - 2y + (2x + 2y - 10) = -4 \\ ② -4x + y - 2(2x + 2y - 10) = 1 \end{cases}$$

$$\begin{cases} 3x = 6 \\ -8x - 3y = -19 \end{cases}$$

$$\begin{cases} x = 2 \\ -16 - 3y = -19 \end{cases}$$

$$-3y = -3$$

$$y = 1$$

$$z = -4$$

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You are an office supply distributor and budget \$7200 for 80 office chairs. You can buy leather chairs for \$125 each, mesh chairs for \$100, and fabric for \$75. If you want to have 3 times as many fabric chairs as leather chairs, how many of each do you need to buy?

$$\begin{cases} x + y + z = 80 \\ 125x + 100y + 75z = 7200 \\ 3x = z \end{cases}$$

16 leather
48 fabric
16 mesh

$$x + y + 3x = 80$$

$$y = (80 - 4x)$$

$$125x + 100(80 - 4x) + 75(3x) = 7200$$

$$125x + 8000 - 400x + 225x = 7200$$

$$8000 - 50x = 7200$$

$$-800 = -50x$$

$$x = 16$$

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Hwk: pg. 171 - 172
#12 - 28 (4th), 32, 36, 38

20, 28, 32, 36, 38

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