# The Elminator III

Solving the system of linear equations by using the *elimination* method.

1) $\begin{aligned} 4x+5y&=-1 \\ 2x-y&=3 \end{aligned}$

1. Can I add or subtract the two equations to eliminate a variable?

1st: *Why, when the equations are added or subtracted, a variable is *not eliminated*? The variables are *not* eliminated because the _____ of the variables are *not* the same (for elimination by subtraction) or opposites of each other (for elimination by addition).

*The _____($x$/$y$) variable could be eliminated if the coefficient of the _____ ($x$/$y$) variable of the second equation was changed from _____ to _____.

| Start with the given system. | Prepare to *eliminate y* by multiplying the 2nd equation by 2. | Write the equations; add to *eliminate y*. |
|---|---|---|
| $4x+5y=-1$ | $4x+5y=-1 \Rightarrow$ | |
| $2x-y=3$ | $5(2x-y=3) \Rightarrow$ | _____ |

2nd:

2. Solve for the remaining variable.

3rd:

3. Solve for the eliminated variable by substituting the known variable value into either of the original equations.

4th: $4x + 5y = -1$ | $2x - y = 3$

4. Verify your solution by substituting the values in to ***both*** equations.

2) $\begin{aligned} 2x+3y&=5 \\ 3x-2y&=1 \end{aligned}$

1. a) Can I add or subtract the two equations to eliminate a variable? - _____ (If yes, stop here and solve!)

b) Can I multiply one equation by a constant to eliminate one of the variables? _____ (If yes, stop here and solve by multiplying the top or bottom equation and solve.)

c) Can I multiply the top equation by a constant, and the bottom equation by a different constant to obtain coefficients of one variable that are the same (to use with subtraction) OR opposites of each other (to use with addition) to eliminate a variable?

I would multiply the top equation by _____ and the bottom equation by _____ so that the coefficients of the _____ ($x$/$y$) variable become _____ (the same/opposites) and can be eliminated.

| Start with the given system. | Prepare to *eliminate* ____ by multiplying the top equation by and the bottom equation by _____. | Write the new equations; ___(+/-) to *eliminate* ___. |
|---|---|---|
| $2x+3y=5 \Rightarrow$ | $2(2x+3y=5) \Rightarrow$ | |
| $3x-2y=1 \Rightarrow$ | $3(3x-2y=1) \Rightarrow$ | |

2nd:

2. Solve for the remaining variable.

3rd:

3. Solve for the eliminated variable by substituting the known variable value into either of the original equations.

4th: $2x+3y=5 \mid 3x-2y=1$

4. Verify your solution by substituting the values in to ***both*** equations.

Solve each of the following systems by the *elimination method*. Verify your *solution*. Ask yourself the following questions for each of the problems below, to help you solve. You do not need to record your answers.

a) Can I add or subtract the two equations to eliminate a variable? _____ (If yes, stop here and solve!)

b) Can I multiply one equation by a constant to eliminate one of the variables? _____ (If yes, stop here and solve by multiplying the top or bottom equation and solve.)

c) Can I multiply the top equation by a constant, and the bottom equation by a different constant to obtain coefficients of one variable that are the same (to use with subtraction) OR opposites of each other (to use with addition) to eliminate a variable?

I would multiply the top equation by _____ and the bottom equation by _____ so that the coefficients of the _____ ($x$/$y$) variable become _____ (the same/opposites) and can be eliminated.

3) $\begin{aligned} x - y &= 2 \\ 2x + 2y &= 4 \end{aligned}$

4) $\begin{aligned} 5x - 6y &= -32 \\ 3x + 6y &= 48 \end{aligned}$

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5) $\begin{aligned} 3x - 10y &= -25 \\ 4x + 40y &= 20 \end{aligned}$

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6) $\begin{aligned} 3x + 2y &= -9 \\ -10x + 5y &= -5 \end{aligned}$