

Topic: Solving systems three ways

Question: Which solution is not being done with substitution? The steps are not explained, so we'll need to figure out what was done in each step.

Answer choices:

A

$$\begin{array}{l} y = x - 3 \\ y = 4x - 9 \\ \hline x - 3 = 4x - 9 \\ 3x = 6 \\ x = 2 \end{array}$$

B

$$\begin{array}{l} y = x - 3 \\ y = 4x - 9 \\ \hline 0 = -3x + 6 \\ 3x = 6 \\ x = 2 \end{array}$$

C

$$\begin{array}{l} y = x - 3 \\ y = 4x - 9 \\ \hline x = y + 3 \\ y = 4(y + 3) - 9 \\ y = 4y + 12 - 9 \\ y = 4y + 3 \\ -3y = 3 \\ y = -1 \end{array}$$

D

$$\begin{array}{l} y = x - 3 \\ y = 4x - 9 \\ \hline x = \frac{y + 9}{4} \\ y = \frac{y + 9}{4} - 3 \\ 4y = y + 9 - 12 \\ 3y = -3 \\ y = -1 \end{array}$$



Solution: B

Looking at answer choice B,

$$\begin{array}{r} y = x - 3 \\ y = 4x - 9 \\ \hline 0 = -3x + 6 \end{array}$$

this first step consisted of subtracting the second equation from the first equation, so this is solving by elimination, not substitution.



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Question: To solve the system by elimination, which of these would not be a useful first step?

$$5x + y = 13$$

$$x - 2y = 7$$

Answer choices:

- A Multiply the second equation by -5 .
- B Multiply the first equation by 2.
- C Subtract the second equation from the first.
- D Divide the second equation by 2.



Solution: C

If we did the step in answer choice A, we'd have the following system of equations:

$$5x + y = 13$$

$$-5x + 10y = -35$$

We could then add the two equations and eliminate x . So this would be a useful first step.

If we did the step in answer choice B, we'd have the following system of equations:

$$10x + 2y = 26$$

$$x - 2y = 7$$

We could then add the two equations and eliminate y . So this would be a useful first step.

If we did the step in answer choice C, we'd have the following equation:

$$5x + y - x + 2y = 13 - 7$$

$$4x + 3y = 6$$

At this point there's no single step that could be done to eliminate x or y , so this wouldn't be a useful first step.

If we did the step in answer choice D, we'd have the following system of equations:



$$5x + y = 13$$

$$\frac{1}{2}x - y = \frac{7}{2}$$

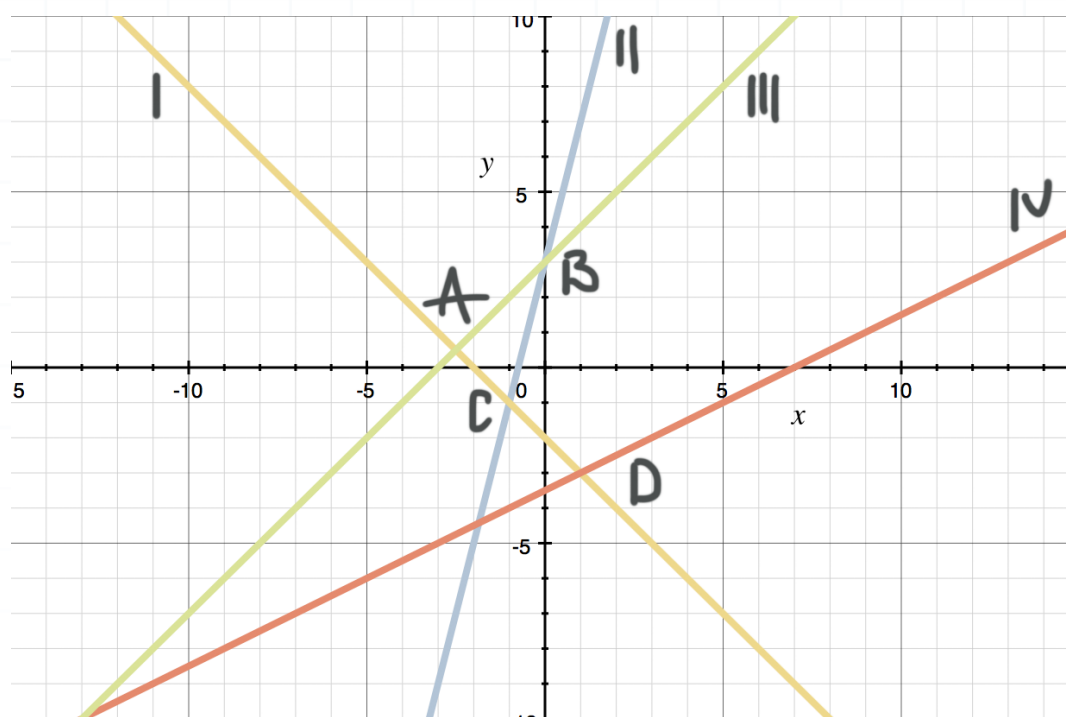
We could then add the two equations and eliminate y . So this would be a useful first step.



Topic: Solving systems three ways**Question:** Which point in the graph is the solution to the system?

$$4x - y = -3$$

$$x + y = -2$$

**Answer choices:**A Point *A*B Point *B*C Point *C*D Point *D*

Solution: C

We can rewrite the two equations in slope-intercept form, and then see which two intersecting graphs belong to those equations. Rewriting

$4x - y = -3$ gives

$$y = 4x + 3$$

This line has a slope of 4 and a y -intercept of 3, which means it corresponds to line II. Rewriting $x + y = -2$ gives

$$y = -x - 2$$

This line has a slope of -1 and a y -intercept of -2 , which means it corresponds to line I. Lines I and II meet at point C.

