

Verifying a Solution for a Linear System

Recall:

The solution to an equation is the value which makes the equation true.

A linear system is two or more linear relations. The solution to a linear system is the point (x,y) that satisfies all linear relations. Graphically, this is the point where the straight lines intersect, or cross each other.

To verify a solution, we check our work in another way to show that the point (x,y) satisfies all of the linear relations in the linear system.

solve graphically

Verifying a Solution for a Linear System

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To verify or check a solution (x,y) :

- (1) Pick an equation to verify.
- (2) Isolate the left side (LS) and right side (RS) of the equation.
- (3) Substitute the x - and y -values from the solution into the left side.
- (4) Substitute into the right side.
- (5) Compare the LS and RS.
- (6) Repeat for every equation in the linear system.

If the $LS = RS$ for every equation, the solution is valid.

Ex. Verify that $(-1, 2)$ is a solution to the system

x y

$$y = 3x + 5 \quad \textcircled{1}$$

$$x + y = 1 \quad \textcircled{2}$$

pick equation
isolate LS RS
sub (x,y) in LS RS
compare LS RS
repeat

$\textcircled{1}: y = 3x + 5$	$LS = x + y \quad RS = 1$
$LS = y \quad RS = 3x + 5$	$LS = (-1) + (2)$
$LS = 2 \quad RS = 3(-1) + 5$	$LS = 1$
$RS = -3 + 5$	$LS = RS \checkmark$
$RS = 2$	
$LS = RS \checkmark$	

$\therefore (-1, 2)$ is a solution.

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Ex.1. Solve $y = 3x - 2$ and $x = y - 2$.

The solution is $(2, 4)$, or $x = 2$ and $y = 4$.

$$y = 3x - 2$$

$$x = y - 2$$

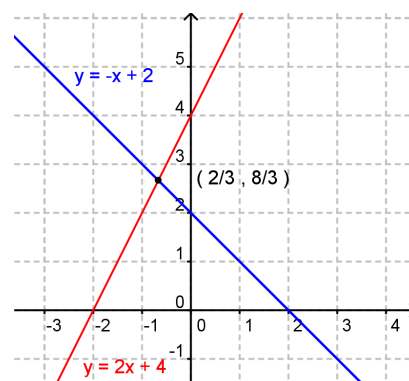
pick equation
isolate LS RS
sub (x,y) in LS RS
compare LS RS
repeat

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$$y = 2x + 4$$

$$y = 2 - x$$

solution: $\left(\frac{-2}{3}, \frac{8}{3}\right)$



pick equation
isolate LS RS
sub (x,y) in LS RS
compare LS RS
repeat

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Assigned Work:

p. 26 # 1ab, 2, 3ab, 5abf, 10, 18*

and

Watch Video:

Solving by Substitution

p. 26

3(b) $x+y=5$ ① $3x+4y=12$ ②
 $y=-x+5$ x -int, set $y=0$
 $3x=12$
 $x=4$
 y -int, set $x=0$
 $4y=12$
 $y=3$

(c) Verify $(8, -3)$
 x y

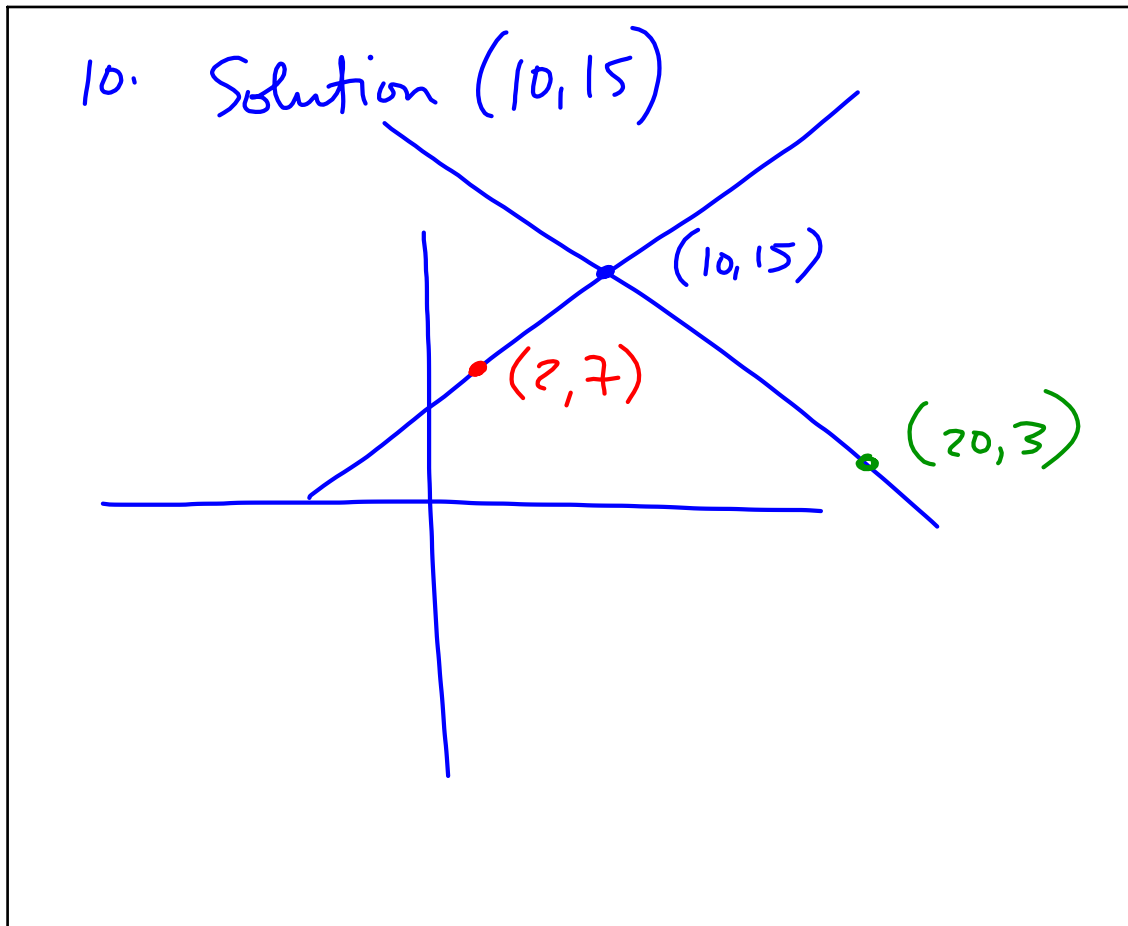
① $x+y=5$
 $LS=x+y$ $RS=5$
 $=8+(-3)$
 $=5$ $LS=RS$ ✓

② $3x+4y=12$
 $LS=3x+4y$ $RS=12$
 $=3(8)+4(-3)$
 $=24+(-12)$
 $=12$ $LS=RS$ ✓
 $\therefore (8, -3)$ is a solution.

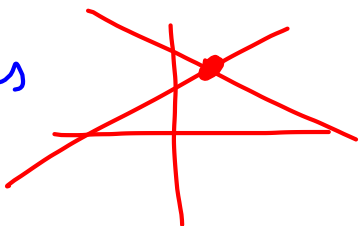
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5 (a) $x+y=3$ $x-y=7$
 $y=-x+3$ $x-7=y$
 $y=x-7$

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18. graph 2 equations
(easiest two). 

→ graph 3rd equation
OR
→ verify solution from
Eq ① and ② in
Eq. ③

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$$5(f) \quad 6x - 5y - 12 = 0$$

$$\frac{6x}{5} - \frac{12}{5} = \frac{5y}{5}$$

$$\frac{6}{5}x - \frac{12}{5} = y$$

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Attachments

Basic 2D Grid.agg