C1 - Solving a System Graphically

Define system of linear equations

Know what a solution to a system of linear equations is

Graph a system of linear equations and determine solution (with/without technology)

Verify that a solution to a system of linear equations is correct

Choose a Wage Problem (Board Work)

You have just started a new job and have been given the following options for your weekly wage.

Option 1: an hourly rate of $10 / hr with a weekly salary of $150.

Option 2: an hourly rate of $15 / hr with a weekly salary of $50.

Which option would you choose? Why?
When would one option be better than the other?

Warm Up

Complete C1 Assignment #1

What is a Solution?

Solve x + 3 = 6

$x = 3$

x	y
3	0
3	-1
3	-2
3	1
3	2
3	3
⋮	⋮

Solve x + y = 5

x	y
2	3
1	4
5	0
-6	11
6	-1
⋮	⋮

What is the solution to
a) x + 3 = 6 and x + y = 5?

(3,2) The point where the lines intersect.

Verify the solution.

(3,2) should make both equations true.

$x+3=6$

$3+3=6$

$6=6$ ✓

$x+y=5$

$3+2=5$

$5=5$ ✓

Definitions

System of Linear Equations:
- two or more linear equations with common variables

e.g. $y = x + 2$

$y = 2x$

Solution to a System of Linear Equations:
- a point of intersection of the two lines
- an ordered pair that satisfies both equations

Verify solution (2,4):

$y = x + 2$
$4 = 2 + 2$
$4 = 4$
LS = RS ✓

$y = 2x$
$4 = 2(2)$
$4 = 4$
LS = RS ✓

There are an infinite number of points on each line. The solution point, (2, 4), is the only point that lies on *both* lines.

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Verify a Solution

Is $(2, -5)$ a solution to the linear system $x - 2y = 12$ and $3x - 2y = 4$.

x y

Verify Algebraically

$x - 2y = 12$
$2 - 2(-5) = 12$
$2 + 10 = 12$
$12 = 12$
LS = RS ✓

$3x - 2y = 4$
$3(2) - 2(-5) = 4$
$6 + 10 = 4$
$16 \neq 4$
LS ≠ RS ✗

(2, -5) is not a solution.

Note: always use the original given equations to verify.

Practice - C1 Assignment #2

Revisit: Choose a Wage Problem

You have just started a new job and have been given the following options for your weekly wage.

Option 1: an hourly rate of $10 / hr with a weekly salary of $150.

Option 2: an hourly rate of $15 / hr with a weekly salary of $50.

Which option would you choose? Why?
When would one option be better than the other?

Use your new found skills to solve this problem (C1 Assignment #3)