Algebra 1

Key

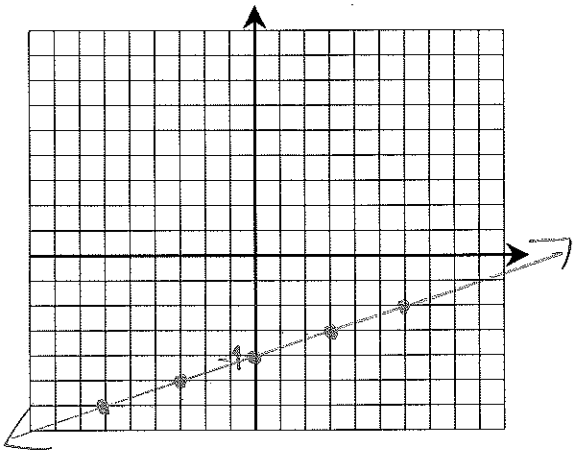
Lesson 7.1

Solve Linear Systems by Graphing

Warm-Up

Graph each equation on the set of axes provided.

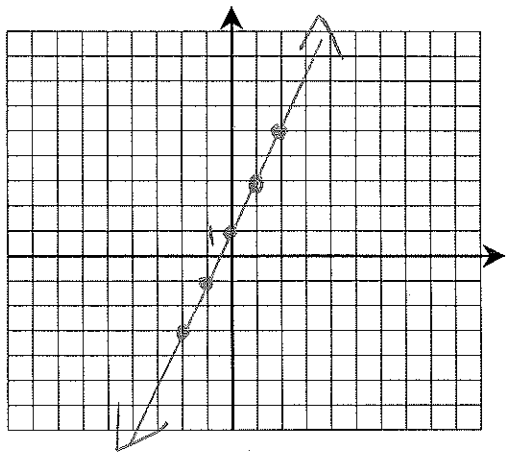
(a) $y = \frac{1}{3}x - 4$



(b) $-2x + y = 1$

$+2x \quad +2x$

$y = 2x + 1$



Determine whether or not the ordered pair (2, -3) is a solution for each equation below.

(c) $3x - 2y = 12$

$-2x + y = -1$

check

$3x - 2y = 12$: $-2x + y = -1$

$3(2) - 2(-3) = 12$: $-2(2) + (-3) = -1$

$6 + 6 = 12$: $-4 + -3 = -1$

YES ✓ $12 = 12$: $-7 \neq -1$ NO

System of Linear Equations – two or more linear equations with the same variables (like x and y)

$2x + 5y = 7$

$-x + 2y = -8$

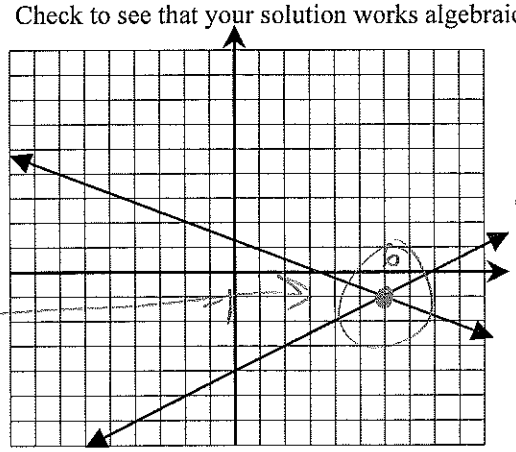
Solution of a System of Linear Equations – an ordered pair that makes both equations true

Example 1. Solve By Finding a Point of Intersection

Use the graph to solve the system of equations. Check to see that your solution works algebraically.

$2x + 5y = 7$

$-x + 2y = -8$



Point of intersection is (6, -1)

so that is the solution

check

$2x + 5y = 7$: $-x + 2y = -8$

$2(6) + 5(-1) = 7$: $-(6) + 2(-1) = -8$

$12 - 5 = 7$: $-6 - 2 = -8$

$7 = 7$ ✓ : $-8 = -8$ ✓

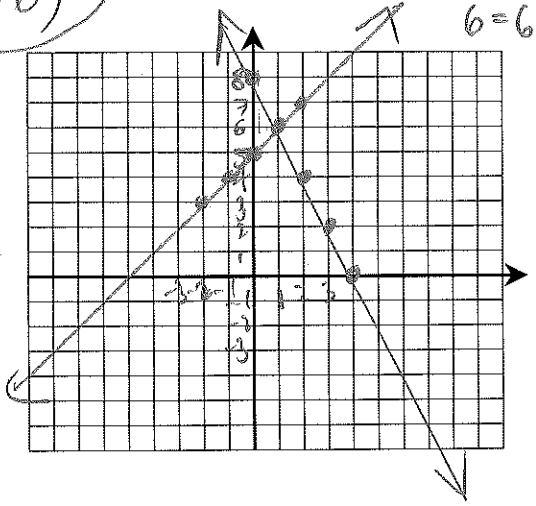
So, Yes (6, -1) is the solution

Example 2. Solve By Using the Graph-and-Check Method
Solve the systems by graphing. Then check each solution algebraically.

(a)
$y = x + 5$
$y = -2x + 8$

Solution
(1, 6)

Check
$y = x + 5$: $y = -2x + 8$
$(6) = (1) + 5$: $6 = -2(1) + 8$
$6 = 6$ ✓ : $6 = -2 + 8$
$6 = 6$ ✓

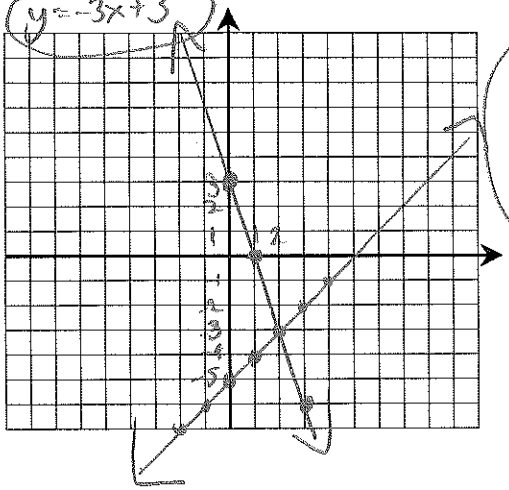


(b)
$x - y = 5$
$3x + y = 3$

$x - y = 5$
$-x \quad -x$
$-y = -x + 5$
$y = x - 5$

$3x + y = 3$
$-3x \quad -3x$
$y = -3x + 3$

Check
$x - y = 5$: $3x + y = 3$
$(2) - (-3) = 5$: $3(2) + (-3) = 3$
$2 + 3 = 5$: $6 - 3 = 3$
$5 = 5$ ✓ : $3 = 3$ ✓

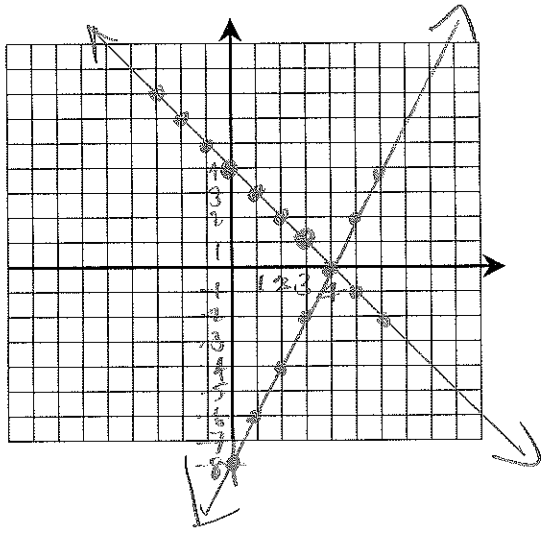


Solution
(2, -3)

Try It!
Solve by graphing. Check your solution.
$y = -x + 4$
$y = 2x - 8$

Solution
(4, 0)

Check
$y = -x + 4$: $y = 2x - 8$
$0 = -(4) + 4$: $0 = 2(4) - 8$
$0 = 0$ ✓ : $0 = 8 - 8$
$0 = 0$ ✓



THE SOLUTION TO A SYSTEM OF LINEAR EQUATIONS IS AN ORDERED PAIR!

Assignment
New: Pg. 430 #2 – 22 (evens, skip #16), 31
Review:
For each of the equations below:
a) Find the x and y intercepts
b) Make a table of values (use x = -2, -1, 0, 1, 2)
c) Write in Slope-Intercept Form
d) Graph

1. $2y = 4x + 8$
2. $3x - 2y - 2 = 0$
3. $2x + 2y = 5$