Review - Part 3

Linear Relationships

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Evaluate (2x - 1) for

a) x = 0 $2x-1 = 2(0)-1 = -1$

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

c) x = 2 $2(2)-1 = 3$

Each value of x will produce a different value for (2x - 1).

We can graph the relationship between x and (2x - 1) by letting y = 2x - 1.

Each pair (x, y) is a point on the x-y plane.

$(0,-1)$

$(1,1)$

$(2,3)$

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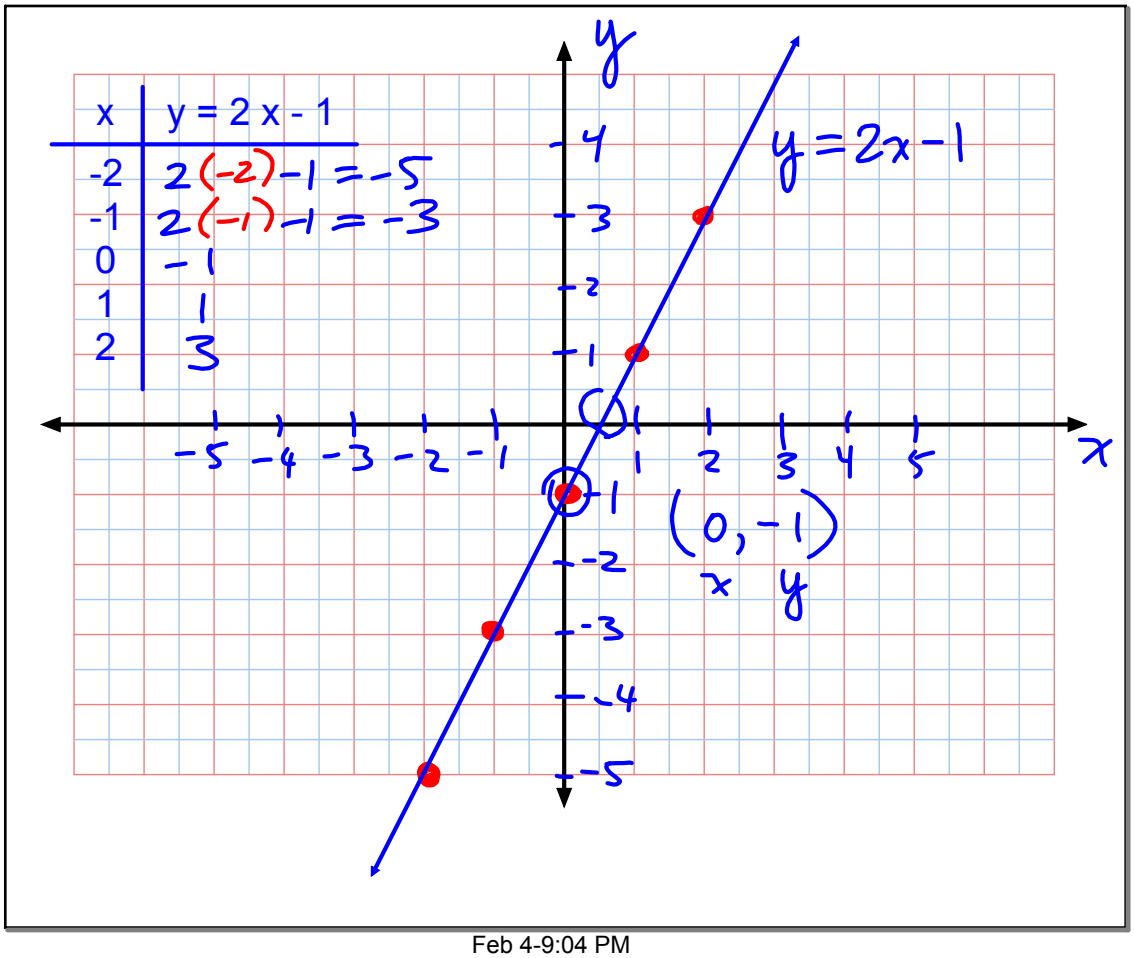

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A linear relationship occurs when both variables are linear (i.e., they have an exponent of 1).

For example,

$x'y' = 1$

(a) y = 2 x - 1 (b) 2 x - y - 1 = 0 (c) 2 x - y = 1

It is possible to graph a linear relationship using:
(1) a table of values
(2) the y-intercept and x-intercept
(3) the y-intercept and the slope (m)

To graph a straight line, only **two points** are required (but a third point is a good check).

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Using the intercepts:

The x-intercept is the **point** where the line crosses the y-axis

The y-intercept is the **point** where the line crosses the x-axis.

$2x - y - 1 = 0$

To find the x-int, set $y = 0$

$2x - (0) - 1 = 0$

$2x - 1 = 0$

$2x = 1$

$x = \frac{1}{2}$

$(\frac{1}{2}, 0)$

To find the y-int, set $x = 0$

$2(0) - y - 1 = 0$

$-y - 1 = 0$

$-1 = y$

$y = -1$

$(0, -1)$

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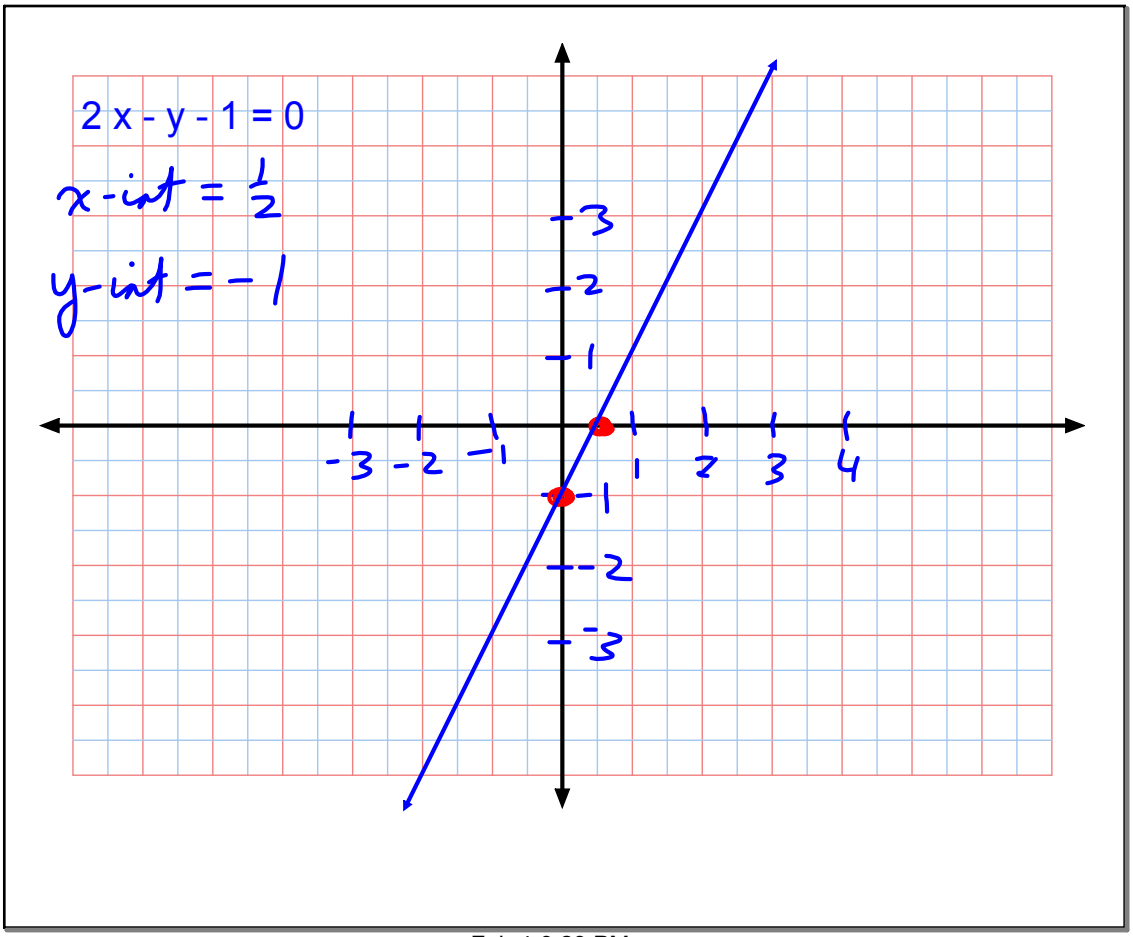

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Using the y-intercept and slope:

"change in"

Recall:

$$m = \text{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\Delta y}{\Delta x}$$

The y-int is our starting point, and we use the slope to find the next point.

A linear equation in slope-intercept form is

$$y = m x + b$$

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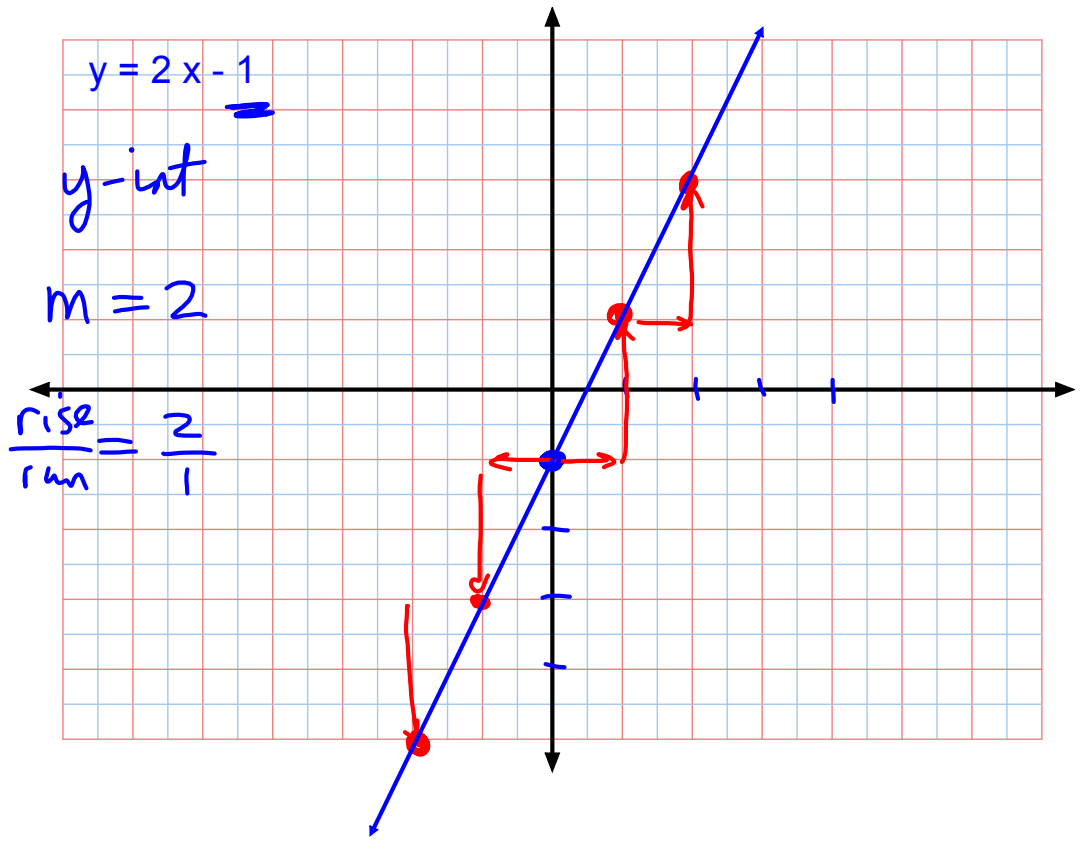

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Assigned Work:

p.4 - 6
2 - 4, 5ace, 7abc, 11acf

Extra practice:

A-6: p.468 # 1bd, 2abc, 3abcd, 4
A-7: p.470 # 1abc, 2ab, 3d, 4bc, 5bc, 6

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Quiz

$x - 3y = 6$ ✓ ©

x-int, set $y = 0$

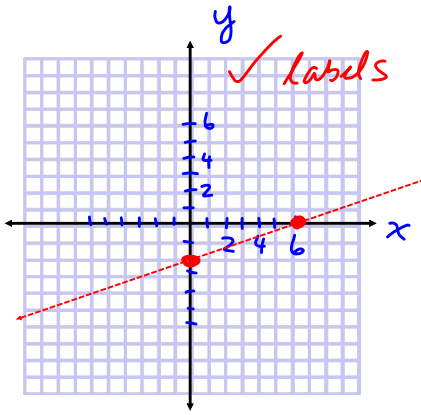
$x - 3(0) = 6$

$x = 6$ ✓

y-int, set $x = 0$

$\frac{-3y}{-3} = \frac{6}{-3}$

$y = -2$ ✓



✓ labels

✓ line

5

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p. 1 #2

$-x + 4y = -16$

$\frac{4y}{4} = \frac{x}{4} - \frac{16}{4}$

$y = \frac{1}{4}x - 4$

$m = \frac{1}{4}$

y-int $= -4$

x-int $= 16$

for x int, set $y = 0$

$-x = -16$

$x = 16$

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p1 #3

$y = \frac{-7}{6}x + 10$

$m = \frac{-7}{6}$

y-int $= 10$

x-int $= \frac{60}{7}$

for x-int, set $y = 0$

$0 = \frac{-7}{6}x + 10$

$\frac{6}{7} \times \frac{7}{6}x = 10 \times \frac{6}{7}$

$x = \frac{60}{7}$

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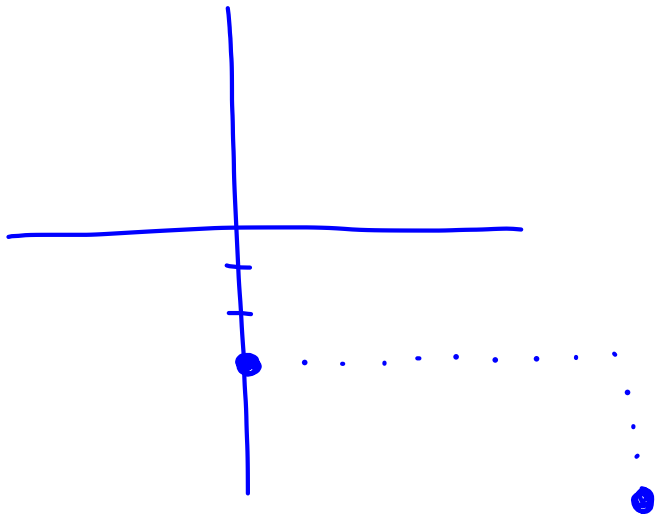
$y = -\frac{4}{9}x - 3$



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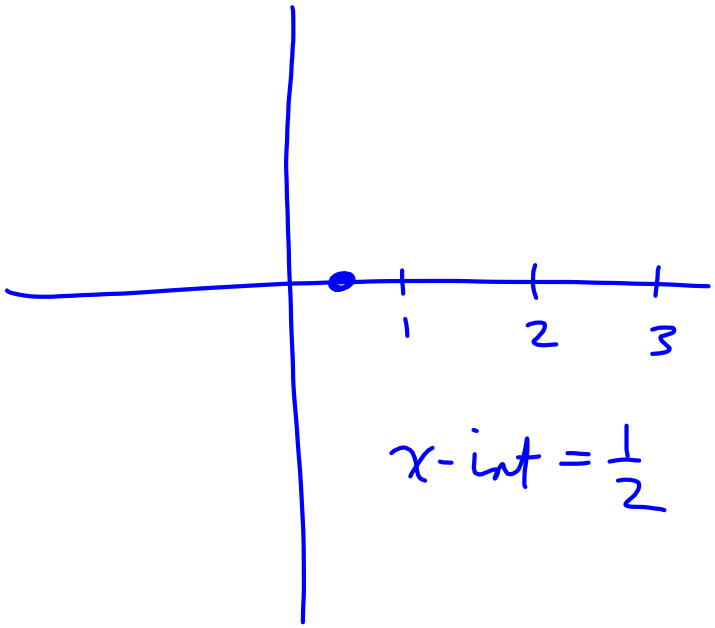

$x\text{-int} = \frac{1}{2}$

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