$Feb\ 3/2011$

Review - Part 3

Linear Relationships

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Evaluate (2x - 1) for
    a) x = 0
    b) x = 1
    c) x = 2

$2(0) - 1 = -1$
$2(1) - 1 = 1$
$2(2) - 1 = 3$

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.

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A <u>linear relationship</u> occurs when both variables
are <u>linear</u> (they have an exponent of 1).

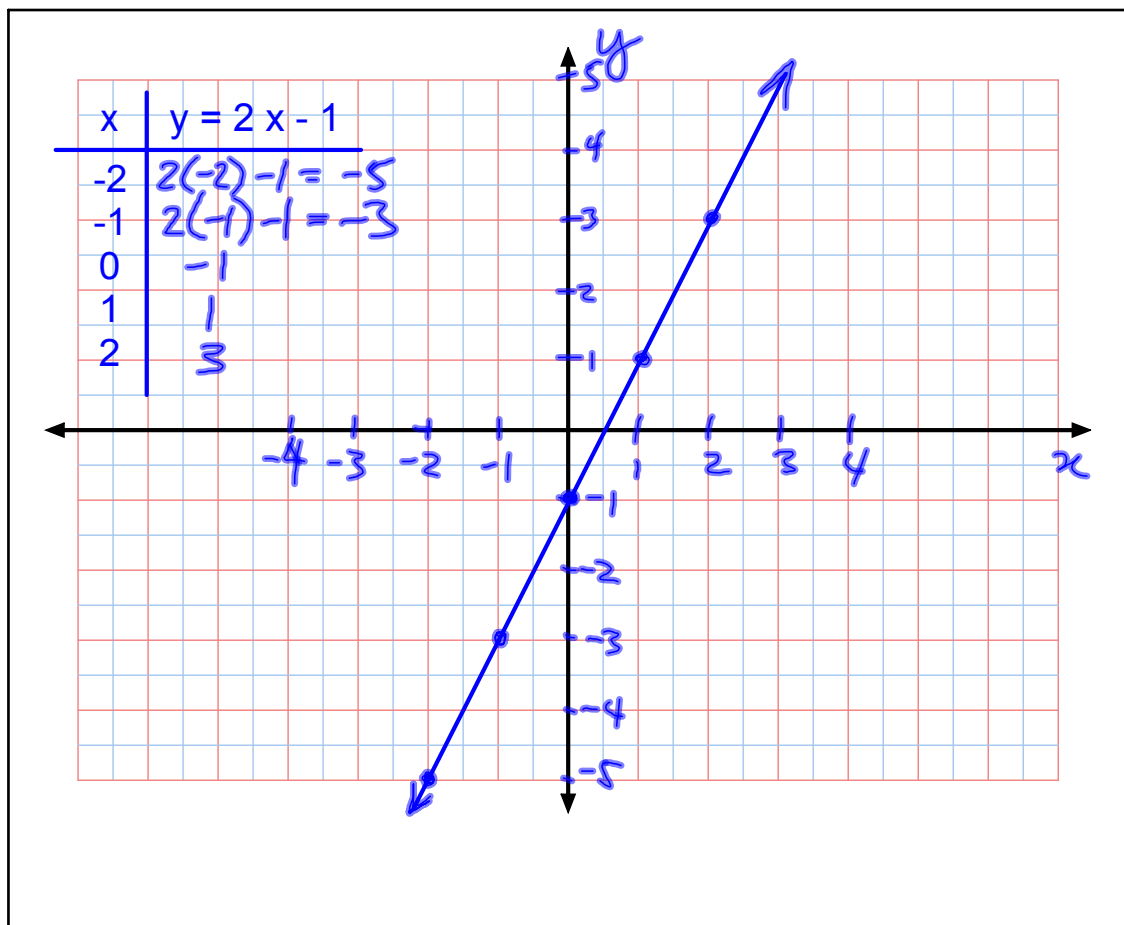(a) y = 2 x - 1   (b) 2 x - y - 1 = 0   (c) 2 x - y = 1

Slope intercept   *Standard*

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.

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x	y = 2 x - 1
-2	2(-2) -1 = -5
-1	2(-1) -1 = -3
0	-1
1	1
2	3

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<u>Using the intercepts:</u>

The x-intercept is the <u>point</u> where the line crosses the <u>x-axis</u>

The y-intercept is the <u>point</u> where the line crosses the <u>y-axis</u>.

$$2x - y - 1 = 0$$

To find the x-int, set <u>y = 0</u> | To find the y-int, set <u>x = 0</u>

$$2x - y - 1 = 0$$

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

$$2x - 1 = 0$$
$$ +1 \quad +1$$

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

$$\boxed{x = \tfrac{1}{2}}$$

$$2x - y - 1 = 0$$

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

$$-y - 1 = 0$$
$$ +1 \quad +1$$

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

$$\boxed{y = -1}$$

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x·int
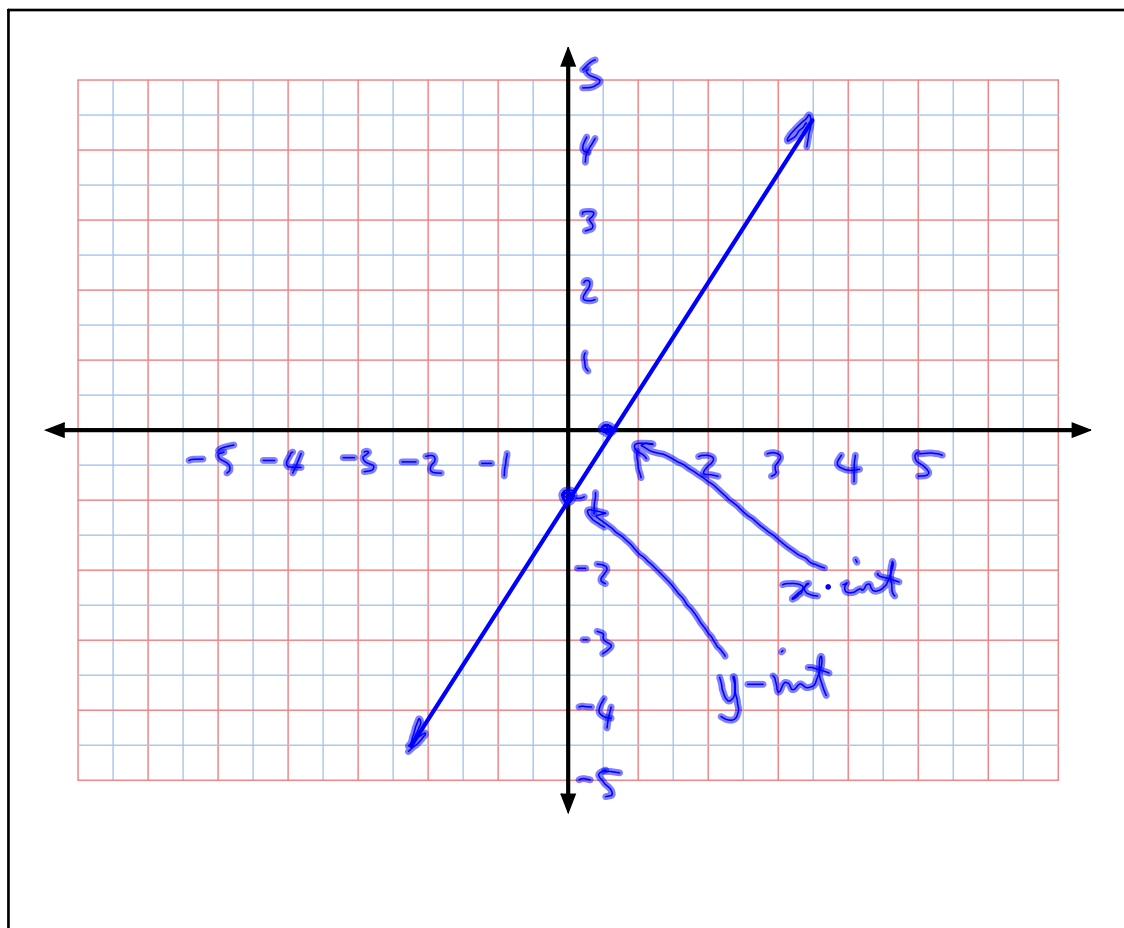
y-int

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Using the y-intercept and slope: Δ is "delta" Means "difference"

Recall:

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

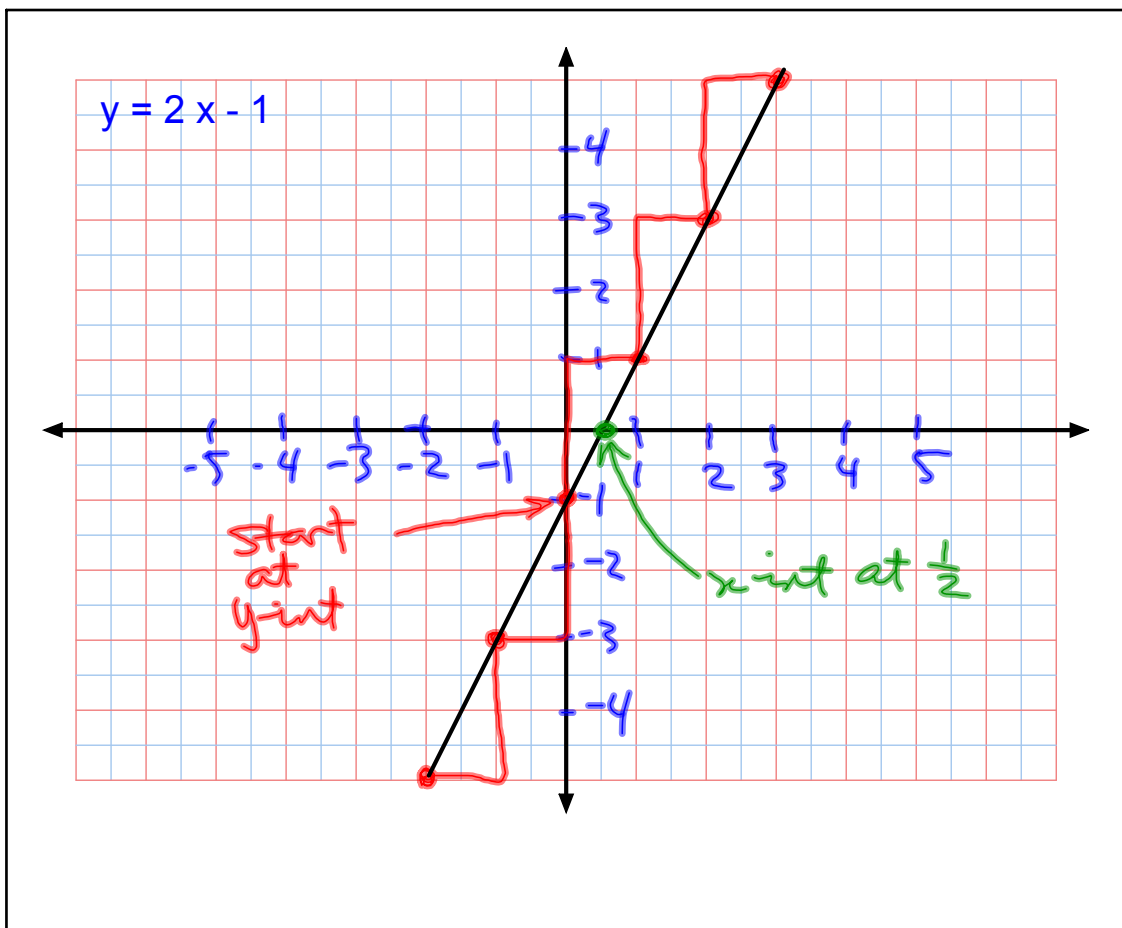The y-int is our starting point, and we use the slope to find the next point.

A linear equation in slope-intercept form is

$$y = mx + b$$

$$y = 2x - 1$$

$$m = 2 \qquad y\text{-int} = -1$$

$$\frac{\text{rise}}{\text{run}} = \frac{2}{1}$$

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$y = 2x - 1$

start at y-int

x-int at $\frac{1}{2}$

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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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$$m = -\frac{1}{2}$$

$$\frac{rise}{run} = \frac{-1}{2} \qquad \text{(down 1)} \qquad \text{(right 2)}$$

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2(b) $x + 2y = 3$

   put into form $y = mx + b$

   $x + 2y = 3$
   $-x \qquad -x$

   $\dfrac{2y}{2} = \dfrac{-1x}{2} + \dfrac{3}{2}$ ① isolate y

   $y = -\dfrac{1}{2}x + \dfrac{3}{2}$ ② want $1y$

slope $= -\dfrac{1}{2}$ y-int $= \dfrac{3}{2}$

   $= 1.5$

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