2.1 Graphing Linear Relationships

How can you graph a linear relation?

1. Make a table of values
2. Find the x and y intercepts
3. Determine the slope and y-intercept (y = mx + b)

Ex. 1 Graph using a table of values

a) $y = -2x + 1$

Sub $x = 1$

$y = -2(1) + 1$

$= -2 + 1$

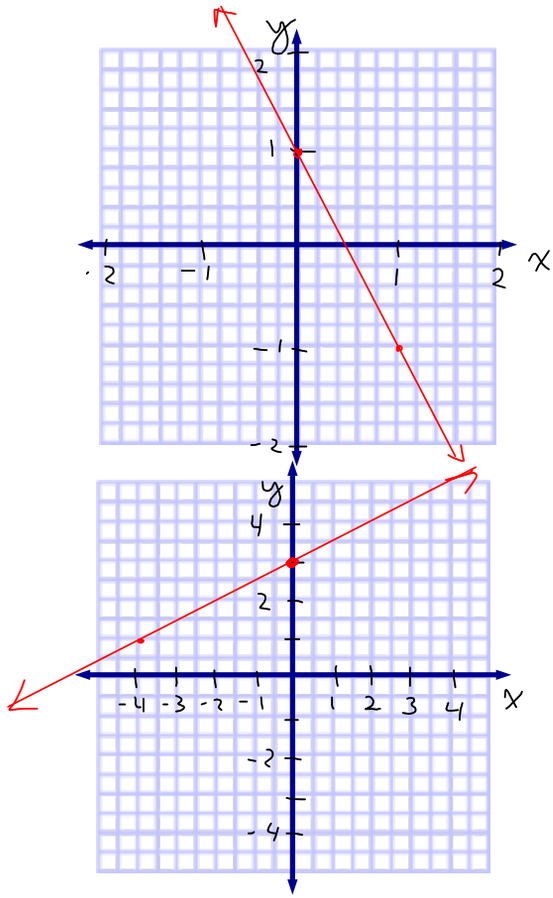
$= -1$

x	y
-2	5
-1	3
0	1
1	-1
2	-3

b) $y = \frac{1}{2}x + 3$

Select x-values that are multiples of 2 to avoid fractions

x	y
-4	1
-2	2
0	3
2	4
4	5



Communication Errors

- Arrows on x and y-axes as well as the line
- Label the line (if more than one line)
- Label axes
- Use a ruler and pencil
- Must show a scale

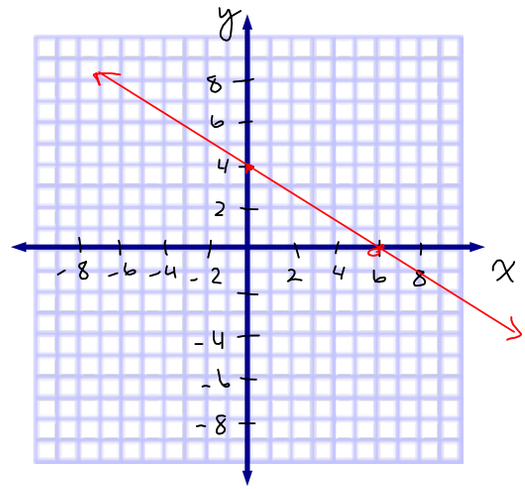
Ex. 2 Graph using x and y-intercepts

Why?

- at the x-intercept, y = 0
- at the y-intercept, x = 0

$2x + 3y = 12$

x-intercept	y-intercept
$y = 0$	$x = 0$
$2x + 3(0) = 12$	$2(0) + 3y = 12$
$2x = 12$	$3y = 12$
$x = 6$	$y = \frac{12}{3}$
$(6, 0)$	$y = 4$
	$(0, 4)$



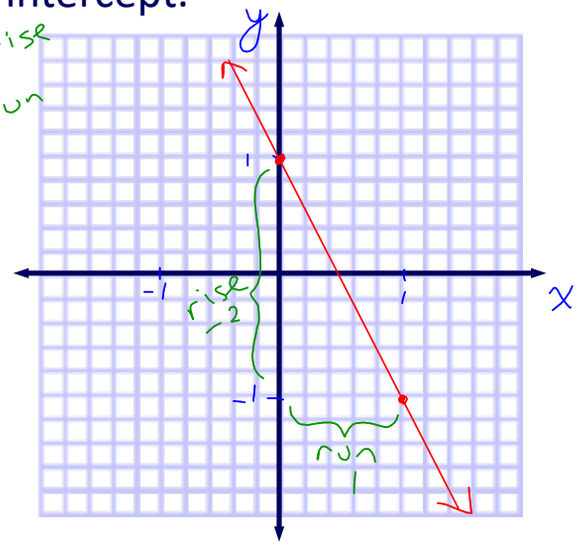
Ex. 3 Graph using the slope and y-intercept.

a) $y = -2x + 1$

slope
m = -2

y-intercept
b = 1

$-2 \rightarrow \frac{-2}{1}$ rise / run



- Plot the y-intercept
- Move over using slope $\left(\frac{\text{rise}}{\text{run}}\right)$

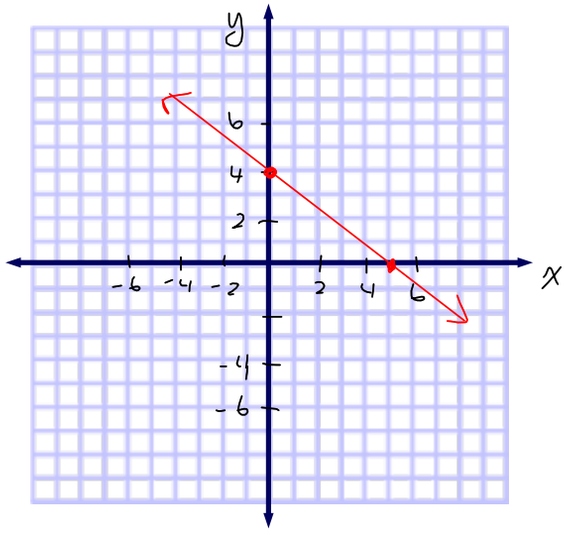
b) $4x = 20 - 5y$

MUST rearrange into the form y=mx+b

$5y + 4x = 20$

$\div 5 \quad 5y = -4x + 20 \quad \div 5$

$y = -\frac{4}{5}x + 4$



y-int: 4

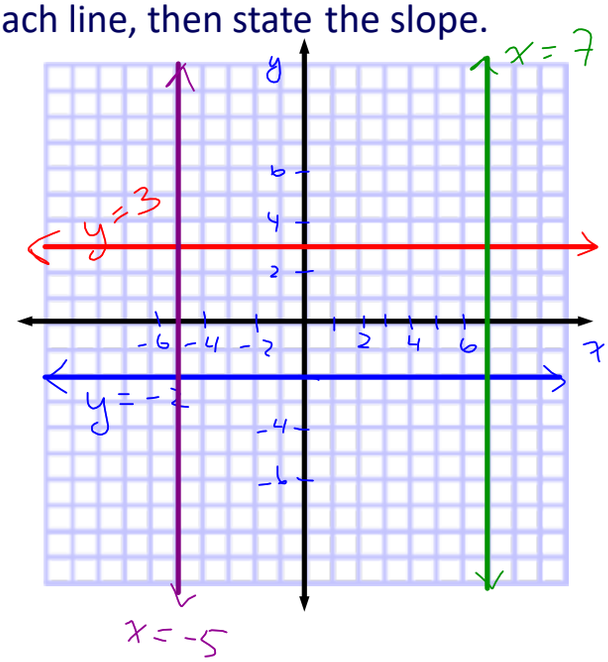
slope: $-\frac{4}{5}$ $\frac{\text{rise}}{\text{run}}$

Special Cases

Ex. 4 Graph each line, then state the slope.

a) y = 3

b) y = -2



c) x = 7

d) x = -5

Practice!

Set 1: p. 5 #5a,6ab,7ab,8ac

Set 2: p. 5 #5d,6d,7bd,8ac