

Review of Linear Relations

Lesson objectives

- I know how to state the slope and y-intercept of a linear relation and use them to graph it
- I know how to find the equation of a line given the y-intercept and slope, the slope and a point on the line, and two points on a line
- I know how to identify if lines are parallel or perpendicular
- I know how to identify and simplify like terms
- I know how to multiply a bracket by a monomial or a binomial

1.1

Lesson objectives

Teachers' notes

Lesson notes

Nelson Page 2 #s 1, 2, & 4 AND Page 82 #s 2 & 6

1. State the slope and y-intercept of each line then graph.

$$y = \frac{2}{3}x - 3$$

$$m = \frac{2}{3}$$

$$b = -3$$

$$y = mx + b$$

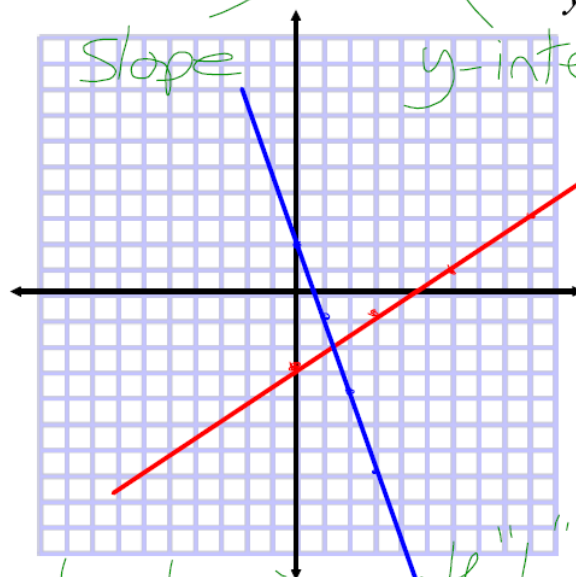
Slope

y-intercept

$$y = -3x + 2$$

$$m = -3$$

$$b = 2$$



To graph = begin with "b" move with "m"

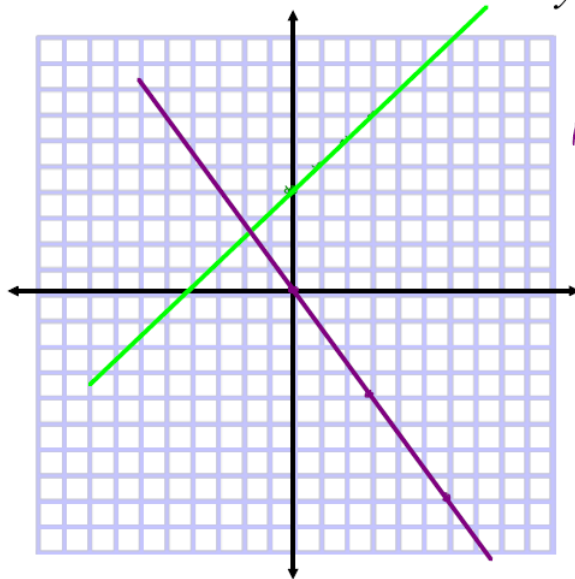


1. State the slope and y-intercept of each line then graph.

$$y = x + 4$$

$$m = 1$$

$$b = 4$$



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

$$m = -\frac{4}{3}$$

$$b = 0$$



2. Find the equation of the following lines:

a) slope = $\frac{4}{3}$, y-intercept = -2

$$y = mx + b$$

$$y = \frac{4}{3}x - 2$$

b) Slope = 2, (-3, 4) is a point on the line

$$y - 4 = 2(x - (-3))$$

$$y - 4 = 2(x + 3)$$

$$y - 4 = 2x + 6$$

$$y = 2x + 10$$

$$y - y_1 = m(x - x_1)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y = mx + b$$

$$4 = 2(-3) + b$$

$$4 = -6 + b$$

$$10 = b \Rightarrow y = 2x + 10$$



2. Find the equation of the following lines:

c. $(5,-1)$ is a point on the line and the y-intercept is 4

$$P_1 = (5, -1) \quad P_2 = (0, 4)$$

 \uparrow b value

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\Rightarrow y = -x + 4$$

$$m = \frac{4 - (-1)}{0 - 5} = \frac{5}{-5} = -1$$

d. $(-3,2)$ and $(4,6)$ are both points on the line $P_1 = (-3,2)$ $P_2 = (4,6)$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y = mx + b$$

using $(4,6)$

$$m = \frac{6 - 2}{4 - (-3)}$$

$$\Rightarrow 6 = \frac{4}{7}(4) + b$$

$$m = \frac{4}{7}$$

$$6 = \frac{16}{7} + b$$

$$6 = 2\frac{2}{7} + b$$

$$6 - 2\frac{2}{7} = b$$

$$3\frac{5}{7} = b$$

$$\Rightarrow y = \frac{4}{7}x + 3\frac{5}{7}$$

3. Explain how we know if two lines are parallel and give an example.

Slopes will be the same

Eg. $y = 3x + 2$

$$y = 3x - 5$$



4. Explain how we know if two lines are perpendicular and give an example.

They will be at right angles to each other
The slopes are negative reciprocals of each other

$$y = \frac{3}{5}x + 1 \quad y = -\frac{5}{3}x - 4$$

$$y = -\frac{1}{3}x + 2 \quad y = 3x - 1$$



5. Give another term that is a like term to each of the following:

$3x$

$5y^2$

$-t$

$\frac{7m}{3}$

Like terms have the same variable(s) and the same exponent(s)

$-5x$

$3y^2$

$-4t$

$\frac{2m}{7}$

$\frac{3}{4}x$

$-2y^2$

$-\frac{3}{8}t$

$-\frac{3}{5}m$

$6.4x$

$\frac{1}{2}y^2$

$\frac{2}{3}t$

$6m$



6. Simplify the following expressions:

$3x + 4y - x + 7y + 2$

$= 2x + 11y + 2$

$6x^2 - 4x + 7 - x^2 - 3x - 10$

$= 5x^2 - 7x - 3$

$(4m + 2n) + (3m - n)$

$4m + 2n + 3m - n$

$= 7m + n$

$(4k - 3r) - (2x - r)$

$4k - 3r - 2x - (-r)$

$4k - 3r - 2x + r$

$= 4k - 2r - 2x$



7. Expand and simplify the following expressions:

$3(x + 1)$

$= 3x + 3$

$2x(x - 4)$

$= 2x^2 - 8x$

$-x(x^2 - 3x + 1)$

$= -x^3 + 3x^2 - x$

$(x + 1)(x - 2)$

$x^2 - 2x + x - 2$

$= x^2 - x - 2$

$(2x - 1)(3x + 2)$

$6x^2 + 4x - 3x - 2$

$= 6x^2 + x - 2$

$(3x - 4)^2$

$= (3x - 4)(3x - 4)$

$= 9x^2 - 12x - 12x + 16$

$= 9x^2 - 24x + 16$

