

Given the function  $g(x) = 3x^2 - 5$

Find the Range for this given domain:  $x = -2, 1, 2, 5$

$$\begin{aligned}
 g(-2) &= 3(-2)^2 - 5 \\
 &\quad 3(4) - 5 = 12 - 5 = 7 \\
 g(1) &= 3(1)^2 - 5 = 3 - 5 = -2 \\
 g(2) &= 3(2)^2 - 5 \\
 &\quad 3 \cdot 4 - 5 = 12 - 5 = 7 \\
 g(5) &= 3(5)^2 - 5 = 75 - 5 = 70 \\
 \text{Range } &\{-2, 7, 70\}
 \end{aligned}$$

Use these functions:

$$f(x) = 5x - 4 \quad g(x) = 2x^2 - x \quad h(x) = \frac{3x+3}{2x-2}$$

1. Find  $2f(-4) + 7g(3)$

$$\begin{aligned}
 f(-4) &= 5(-4) - 4 \\
 &\quad -20 - 4 \\
 &\quad = -24 \\
 2f(-4) &= 2(-24) \\
 &\quad = -48 \\
 g(3) &= 2(3)^2 - 3 \\
 &\quad 2 \cdot 9 - 3 \\
 &\quad 18 - 3 \\
 &\quad 7 \cdot 15 \\
 &\quad 105 \\
 -48 + 105 &= 57
 \end{aligned}$$

Use these functions:

$$f(x) = 5x - 4 \quad g(x) = 2x^2 - x \quad h(x) = \frac{3x+3}{2x-2}$$

1. Find  $2f(-4) + 7g(3)$

2. Find  $h(2x-5)$ .

Simplify if possible.

$$\begin{aligned}
 &\frac{3(2x-5) + 3}{2(2x-5) - 2} \\
 &\frac{6x-15+3}{4x-10-2} = \frac{6x-12}{4x-12} \\
 &\frac{3x-6}{2x-6}
 \end{aligned}$$

Equations for Lines:

- Slope-Intercept Form  $y = mx + b$
- Point-Slope Form  $y - y_1 = m(x - x_1)$
- Standard Form  $Ax + By = C$

A line passes through the points (4,-7) and (2, 9)  
Write the equation of this line in both Point-Slope and Slope-Intercept Forms.

Point-Slope Form:  $\frac{y' - y''}{x' - x''} = \frac{y - y_1}{x - x_1}$

$$\frac{9 - (-7)}{2 - 4} = \frac{y - (-7)}{x - 4}$$

$$\frac{16}{-2} = -8$$

Slope-Intercept Form:  $y - y_1 = m(x - x_1)$

$$y - 9 = -8(x - 2)$$

$$y - 9 = -8x + 16$$

$$y = -8x + 25$$

or

$$y + 7 = -8(x - 4)$$

Write the equation of the line that passes through this pair of points in Slope-Intercept Form:

(6, -10) and (15, -25)

$$\frac{-25 - (-10)}{15 - 6} = \frac{-15}{9} = -\frac{5}{3}$$

$$y + 25 = -\frac{5}{3}(x - 15)$$

$$y + 25 = -\frac{5}{3}x + 25$$

$$y = -\frac{5}{3}x$$

f

Because this line passes through the origin it has a special name:

Direct Variation

Equations of Horizontal and Vertical lines:

Because the slope of a Horizontal Line = 0

$y = mx + b$  becomes  $y = b$   
b is not only the y-intercept it is the y-coordinate of any point on the line.

Because the slope of a Vertical Line is Undefined it's equation can't be written in Slope-Intercept Form

Vertical Line Eq:  $x = \#$   
this is the x-intercept or the x-coordinate of any point on the line.

Write the equation of the line that passes through these two points:

(4, 3) & (-6, 3)

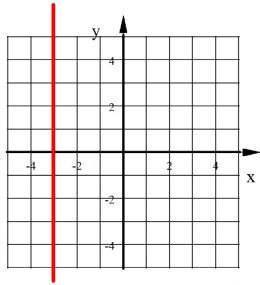
$$y = 3$$

Write the equation of the line that passes through these two points:

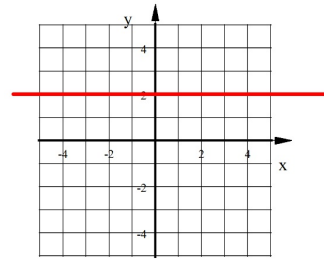
(5, -8) & (5, -1)

$$x = 5$$

Write the equation of each line:



$$x = -3$$



$$y = 2$$

Write the equation of the line that passes through this pair of points:

(3, 10) and (-4, 10)

$$y = 10$$

Write the equation of the line that passes through this pair of points:

(2, -7) and (2, 8)

$$x = 2$$