Bellwork Alg 2A Monday, November 7, 2016

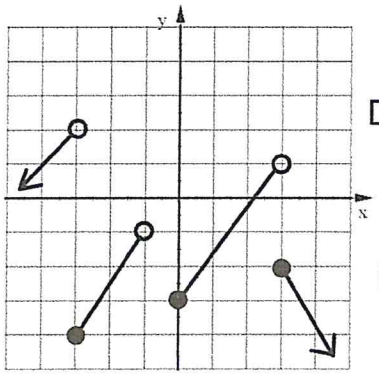
1. Use these functions: $f(x) = 2x^2 + 8$ $g(x) = 5x - 1$ $h(x) = \frac{5x-1}{2x+1}$

a) Find the range of $f(x)$ for this domain: $\{-3, -1, 0, 3\}$

b) Find x if $g(x) = 33$

c) Find $5f(2) - 10h(3)$

2. State the Domain and Range of this graph:

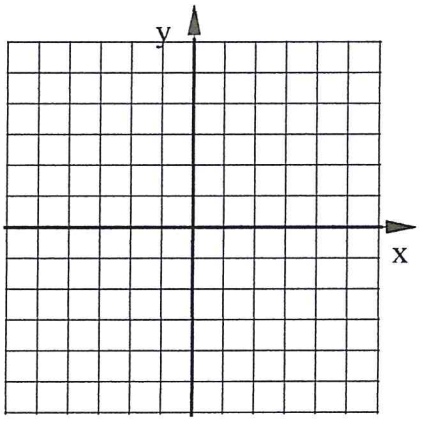


Domain:

Range:

3. Graph this piecewise function:

$$f(x) = \begin{cases} 3 & \text{if } x < -2 \\ 2|x-1| - 3 & \text{if } -2 \le x \le 3 \\ x - 4 & \text{if } x > 3 \end{cases}$$



4. Is each pair of lines parallel, perpendicular, or neither?

a.
$y = 4x - 1$
$8x - 2y = 14$

b.
$y = 3$
$x + 3y + 15$

c.
$y + 2 = 5(x + 1)$
$3x + 15y = 105$

5. Write the equation of the line that passes through the given points in both Point-Slope and Slope-Iintercept Forms:

Points: $(-21, 18)$ & $(15, 6)$

Slope-Intercept Form: Point-Slope Form:

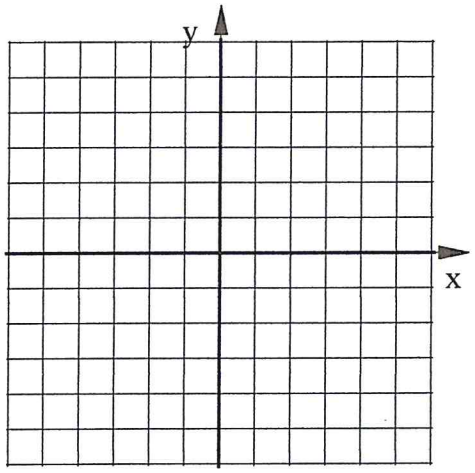
6. The length of a shadow varies directly with the height of the object. A 6 foot tall person casts a 10 foot long shadow.

a) Find the variation constant, include units. Define your variables.

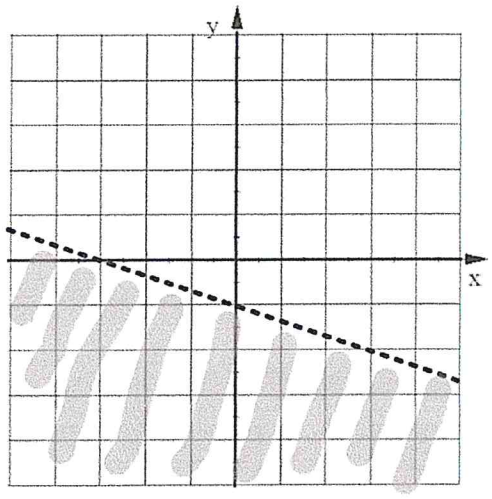
b) Write a Direct Variation Equation.

c) Find the height of a tree if it casts a 24 foot long shadow.

7. Graph this inequality: $24x - 18y \leq 72$



8. Write the inequality shown in the graph.



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Answers

1. Use these functions: $f(x) = 2x^2 + 8$ $g(x) = 5x - 1$ $h(x) = \frac{5x-1}{2x+1}$

a) Find the range of $f(x)$ for this domain: $\{-3, -1, 0, 3\}$

$f(-3) = 2(-3)^2+8 = 2(9)+8 = 18+8 = 26$
$f(-1) = 2(-1)^2+8 = 2(1)+8 = 2+8 = 10$
$f(0) = 2(0)^2+8 = 8$
$f(3) = 2(3)^2+8 = 2(9)+8 = 18+8 = 26$

Range: $\{8, 10, 26\}$

b) Find x if $g(x) = 33$

$33 = 5x - 1$
$+1 \quad +1$
$\frac{34}{5} = \frac{5x}{5}$

$x = 6.8$

c) Find $5f(2) - 10h(3)$

$f(2) = 2(2)^2+8 = 16$

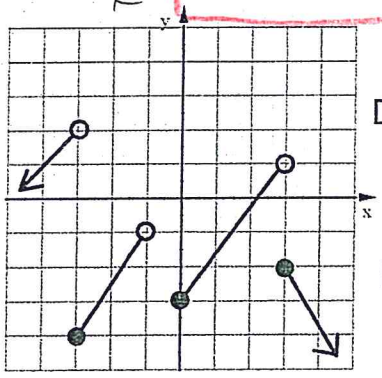
$h(3) = \frac{5(3)-1}{2(3)+1} = \frac{14}{7} = 2$

$5(16) - 10(2)$
$80 - 20 = 60$

2. State the Domain and Range of this graph:

Domain: $x < -1, x \geq 0$

Range: $y < 2$

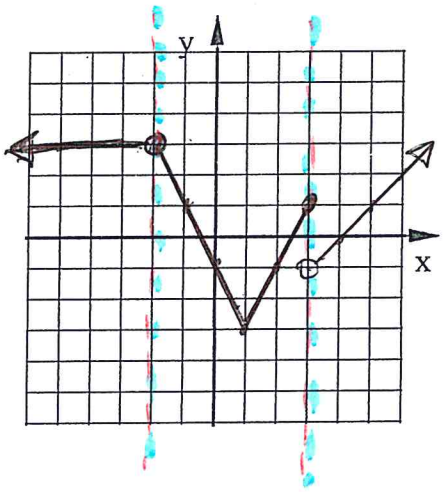


Domain:

Range:

3. Graph this piecewise function:

$$f(x) = \begin{cases} 3 & \text{if } x < -2 \\ 2|x-1| - 3 & \text{if } -2 \leq x \leq 3 \\ x - 4 & \text{if } x > 3 \end{cases}$$



4. Is each pair of lines parallel, perpendicular, or neither?

a.
$y = 4x - 1$ $m = 4$ $b = -1$
$8x - 2y = 14$
$y = \frac{14-8x}{-2}$
$y = -7 + 4x$ $m = 4$ $b = -7$

Parallel

b.
$y = 3$ $m = 0$ → HORIZ
$x + 3y + 15$ → NOT HORIZ OR VERT
$y = \frac{15-x}{3}$
$y = 5 - \frac{1}{3}x$ $m = -\frac{1}{3}$

Neither

c.
$y + 2 = 5(x + 1)$ → $y = 5x + 3$ $m = 5$
$3x + 15y = 105$
$y = \frac{105-3x}{15}$
$y = 7 - \frac{1}{5}x$
$m = -\frac{1}{5}$

Perpendicular

5. Write the equation of the line that passes through the given points in both Point-Slope and Slope-Intercept Forms:

Points: (–21,18) & (15,6)

$m = \frac{18-6}{-21-15} = \frac{12}{-36} = -\frac{1}{3}$

Slope-Intercept Form:

$y = -\frac{1}{3}x + 11$

Point-Slope Form:

$y - 18 = -\frac{1}{3}(x+21)$

or

$y - 6 = -\frac{1}{3}(x-15)$

$y - 6 = -\frac{1}{3}x + 5$

$+6 \quad +6$

$y = -\frac{1}{3}x + 11$

6. The length of a shadow (y) varies directly with the height of the object (x). A 6 foot tall person casts a 10 foot long shadow.

a) Find the variation constant, include units. Define your variables.

$k = \frac{y}{x} = \frac{\text{length of shadow}}{\text{height of object}}$

$= \frac{10 \text{ ft}}{6 \text{ ft}} = \frac{5}{3} \frac{\text{ft of shadow}}{\text{ft of object}}$

b) Write a Direct Variation Equation.

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

y = length of shadow (ft)

x = height of object (ft)

c) Find the height of a tree if it casts a 24 foot long shadow. ⇒ y

use an EQ

$\frac{3}{5} \cdot 24 = \frac{5}{3}x \cdot \frac{3}{5}$

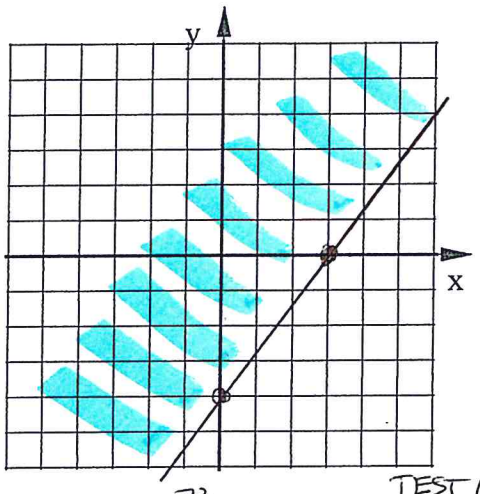
$x = 14.4$ ft high

or use a proportion

$\frac{10 \text{ ft of shadow}}{6 \text{ ft tall}} = \frac{24 \text{ ft of shadow}}{x \text{ tall}}$

$x = 14.4$ ft high

7. Graph this inequality: $24x - 18y \leq 72$



x-int $= \frac{72}{24} = 3$

y-int $= \frac{72}{-18} = -4$

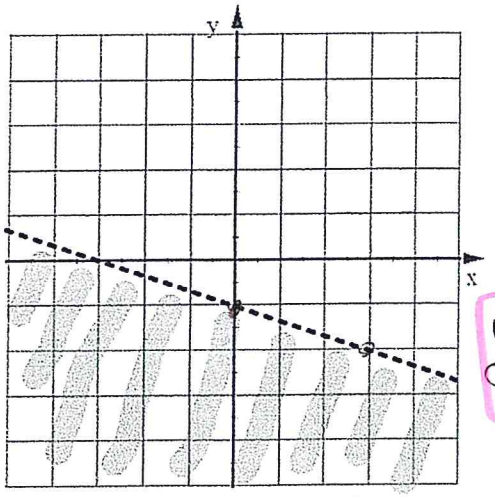
TEST (0,0)

$24(0) - 18(0) \leq 72$

$0 \leq 72$

this is true so shade side with the origin

8. Write the inequality shown in the graph.



shade below & dashed line: $y <$

$m = -\frac{1}{3}$

$b = -1$

$y < -\frac{1}{3}x - 1$