

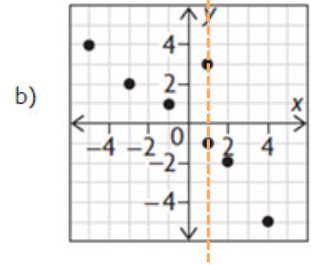
These review lessons should not be considered a comprehensive review of all topics. You should be reviewing ALL of your notes, quizzes, tests, and textbook to prepare for the exam/summative.

Unit I Review - Introduction to Functions

1. State which relations are functions. Explain.

a) $\{(-3, 2), (-4, 1), (0, 1), (2, 2), (6, 1)\}$

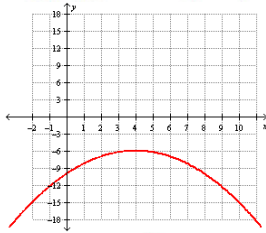
Function, each x has one y .



Not a function, fails vertical line test.

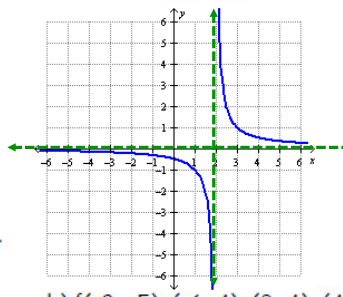
2. Determine the domain and range of each function.

a) $f(x) = -0.25(x-4)^2 - 6$



*D: $x \in \mathbb{R}$
R: $y \in \mathbb{R}, y \leq -6$*

b) $f(x) = \frac{1}{-(2-x)}$



*D: $x \in \mathbb{R}, x \neq 2$
R: $y \in \mathbb{R}, y \neq 0$*

3. Determine the inverse, $f^{-1}(x)$, of each function.

a) $f(x) = \frac{x-4}{5}$

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

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

$5x = y - 4$

$y = 5x + 4$

$f^{-1}(x) = 5x + 4$

b) $\{(-8, -5), (-6, 4), (3, 4), (4, 7), (6, -2)\}$

Inverse = $\{(-5, -8), (4, -6), (4, 3), (7, 4), (-2, 6)\}$

4. For $f(x) = -4x - 6$, evaluate $f(2a+3) - f(4-a)$.

$= -4(2a+3) - 6 - [-4(4-a) - 6]$
 $= -8a - 12 - 6 - [-16 + 4a - 6]$
 $= -8a - 18 + 16 - 4a + 6$
 $= -12a + 4$

5. The function $y = f(x)$ has been transformed to $y = af[k(x-d)] + c$. Determine the values of a , k , d , and c .

a) A vertical stretch of factor 4 and a translation of 2 units to the left are applied to $y = f(x)$.

$$\therefore a = 4$$

$$k = 1$$

$$d = -2$$

$$c = 0$$

$$\therefore y = 4f(x+2)$$

b) A horizontal stretch of factor $\frac{1}{2}$, a reflection in the x -axis, and translations 1 unit to the right and 6 units down are applied to $y = f(x)$.

$$y = af[k(x-d)] + c$$

$$\therefore a = -1$$

$$k = 2$$

$$d = +1$$

$$c = -6$$

$$y = -f[2(x-1)] - 6$$