Semester 1 Review – Part 2: Functions

1. Consider the function $f : x \mapsto \sqrt{x+1},\ x \geq -1$

(a) Determine the inverse function f^{-1}.

(b) What is the domain of f^{-1}?

2. Use the functions $f(x) = 2x - 3\ and\ g(x) = x^2 + x$ to answer the questions below:

a) Determine the composite function $(f \circ g)(x)$

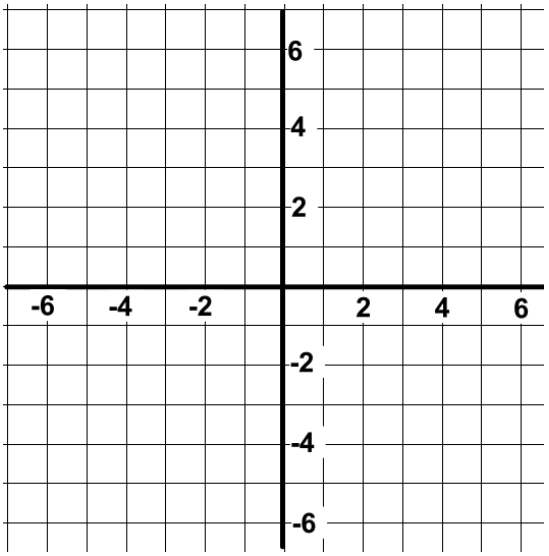
b) Determine the composite function $(g \circ f)(x)$. Does this equal $(f \circ g)(x)$?

c) Evaluate $(g \circ f)(3)$

3. Suppose $f(x) = ax + b$ where a and b are constants. If $f(1) = 7\ and\ f(3) = -5$ then determine the values of a and b. Use a and b to calculate $f(10)$.

4. Use the function $f(x) = \frac{3}{x-1}$ to answer the following:

a) Find the axes intercepts for the function.



b) Determine the Domain and Range for f(x).

Domain: _____

Range: _____

c) Identify all the asymptotes of this function.

d) Sketch a graph of the function at the right.

e) Calculate $f^{-1}(x)$.

f) Evaluate $(f^{-1} \circ f)(15)$.

5. The function $\boldsymbol{f(x) = a(x-h)^2 + k}$ is a quadratic function in Vertex Form. Use the following information to determine the constants $\boldsymbol{a, h, and\ k}$ in this function.

The Axis of Symmetry is given by the equation: $\boldsymbol{x = 2\ and\ we\ know\ f(2) = 4\ and\ f(4) = 0}$.

6. Simplify each of the following and **do not use** any negative exponents in your final answer.

a. $\frac{p^{18}}{p^{11}} =$ b. $(x^{-3}y)^{-4} =$ c. $\frac{12x^2y^5 \cdot (xy)^0}{y^8} =$