

Combinations of Functions and Inverse Functions Worksheet

This document was composed and formatted by Annie Bernatchez.

The course material originated from www.jensenmath.ca

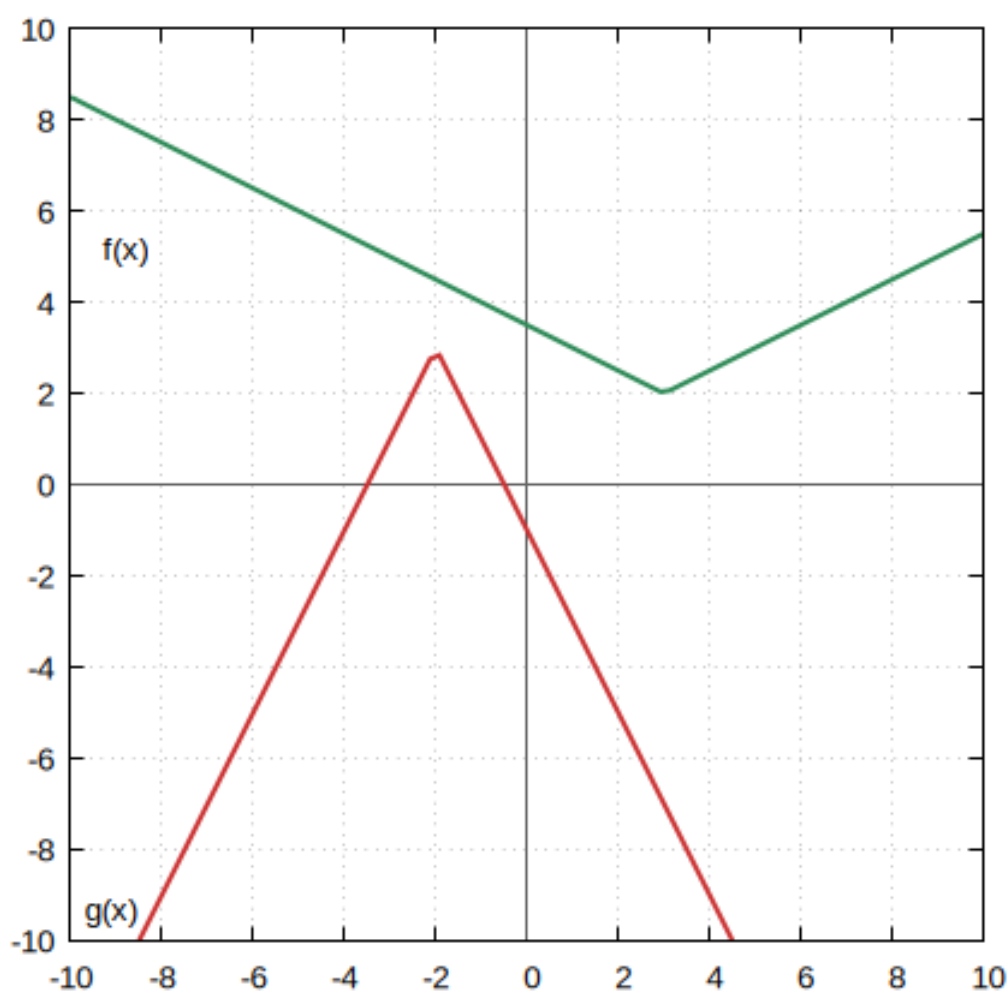
1) Let $f(x) = 3x - 5$ and $g(x) = 2x + 3$.

a) Write the equation for $h(x) = f(x) + g(x)$ and determine the value of $h(2)$.

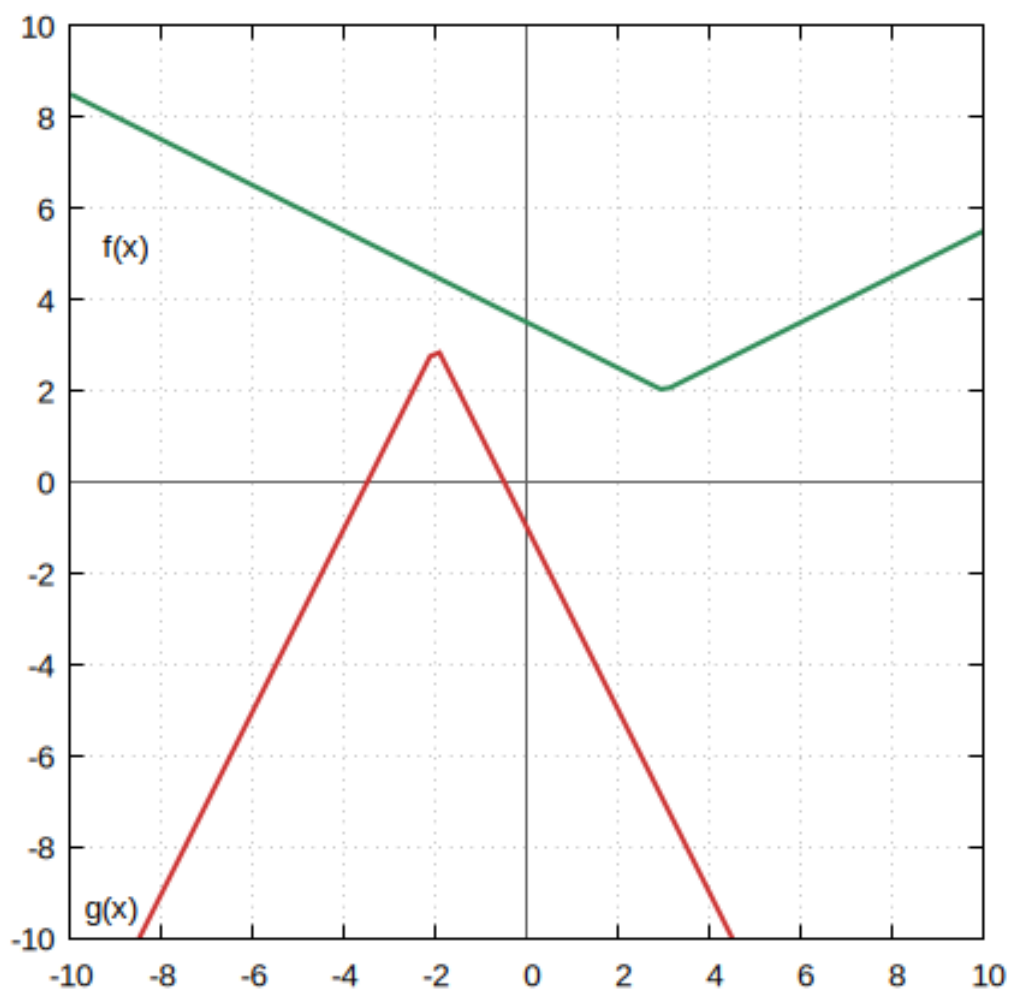
b) Write the equation for $k(x) = f(x) - g(x)$ and determine the value of $k(2)$.

2) Use the functions $f(x)$ and $g(x)$ as shown. Apply the superposition principle to graph

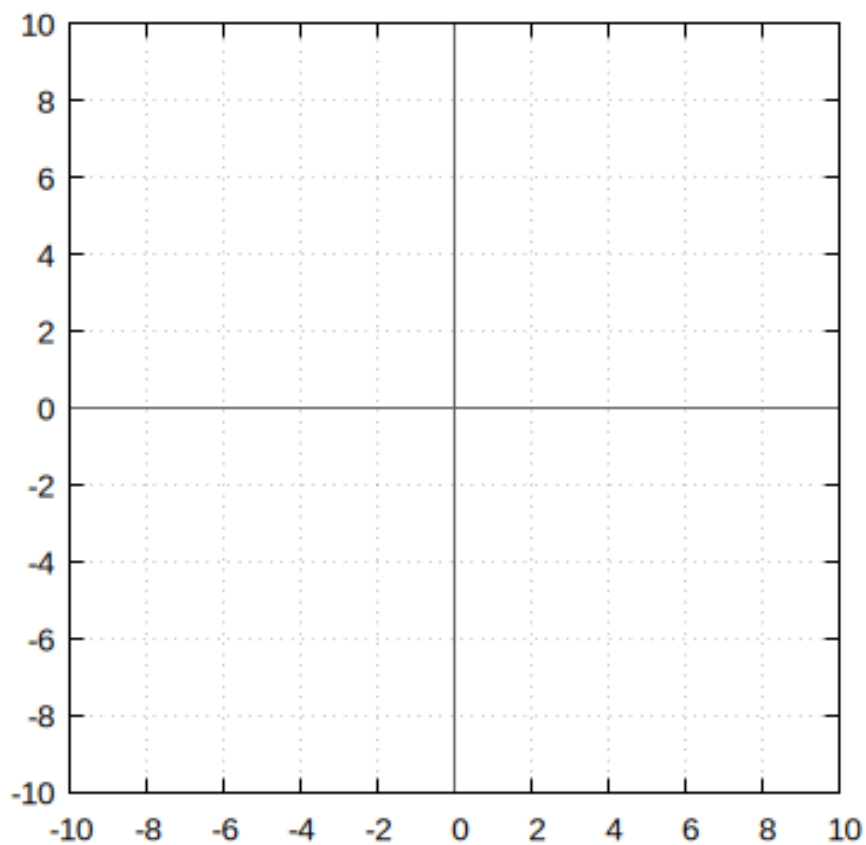
a) $y = f(x) + g(x)$



b) $y = f(x) - g(x)$

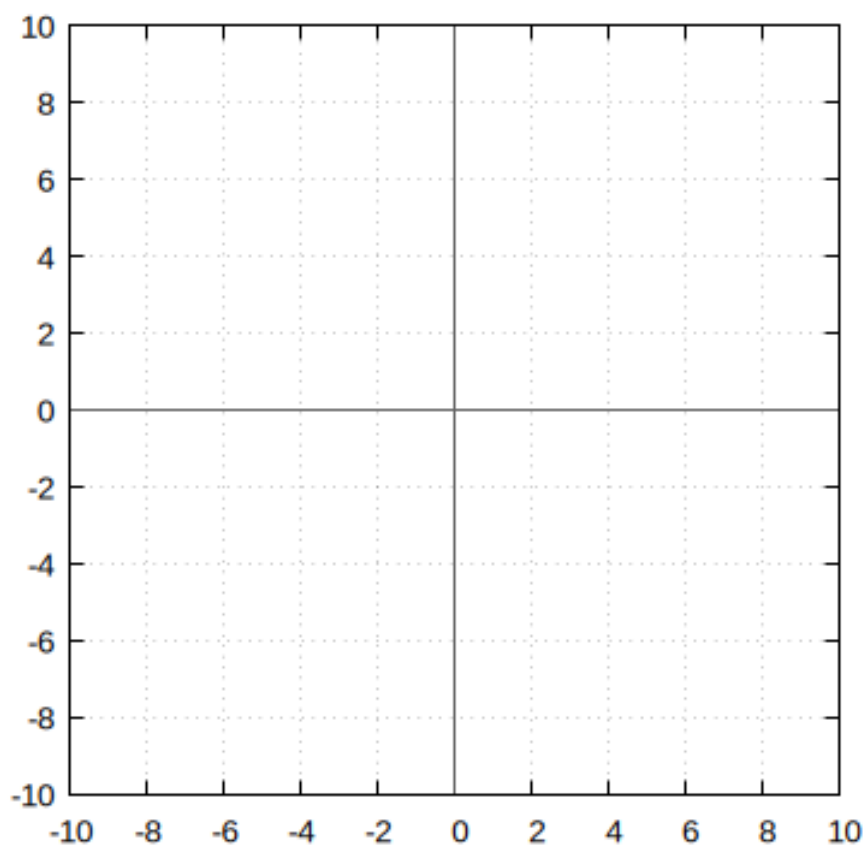


3) Let $f(x) = x - 2$ and $g(x) = x^2 + 3x - 3$. Determine an algebraic and graphical model for $h(x) = f(x) + g(x)$.

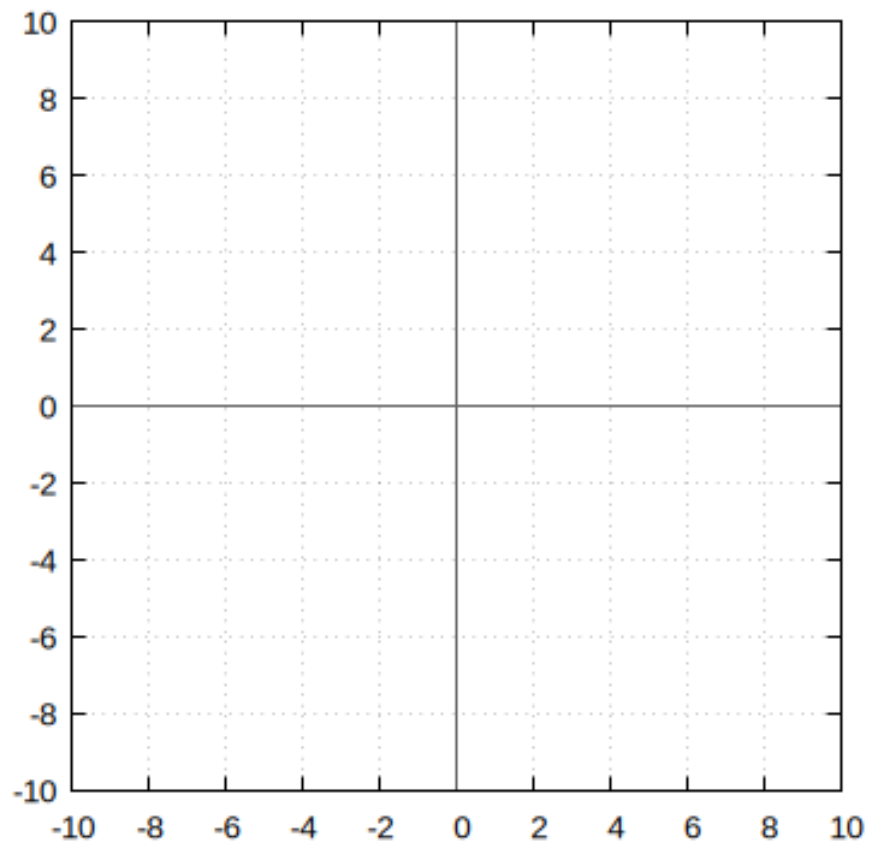


4) Let $f(x) = x - 2$ and $g(x) = x^2 - 4$. Develop an algebraic and graphical model for each of the following:

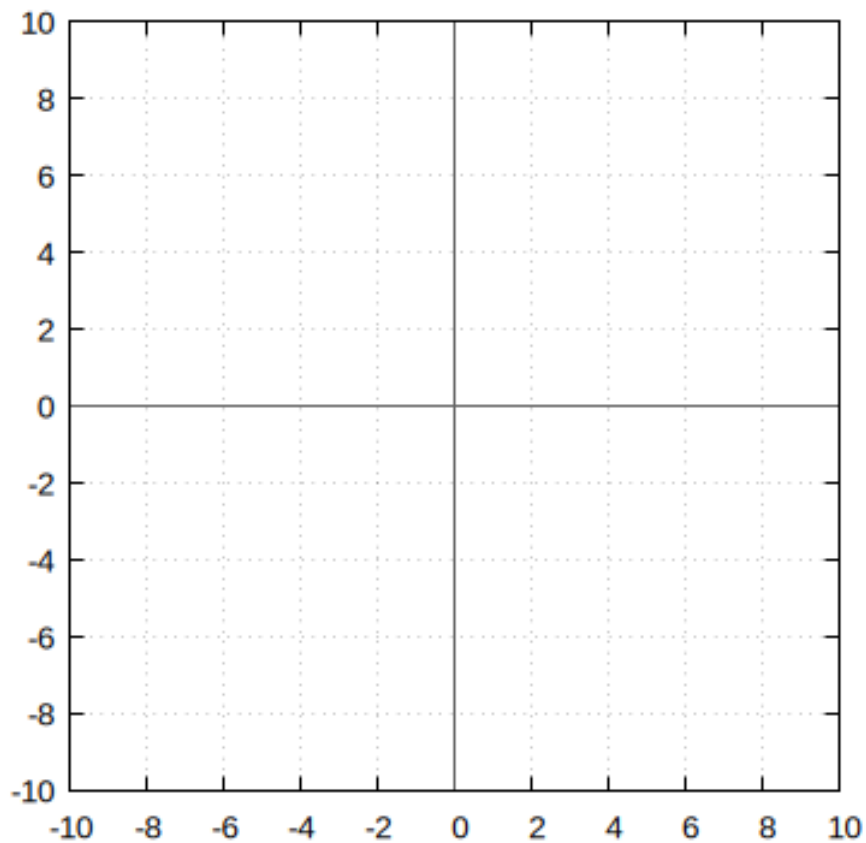
a) $y = f(x)g(x)$



b) $y = \frac{f(x)}{g(x)}$



c) $y = \frac{g(x)}{f(x)}$



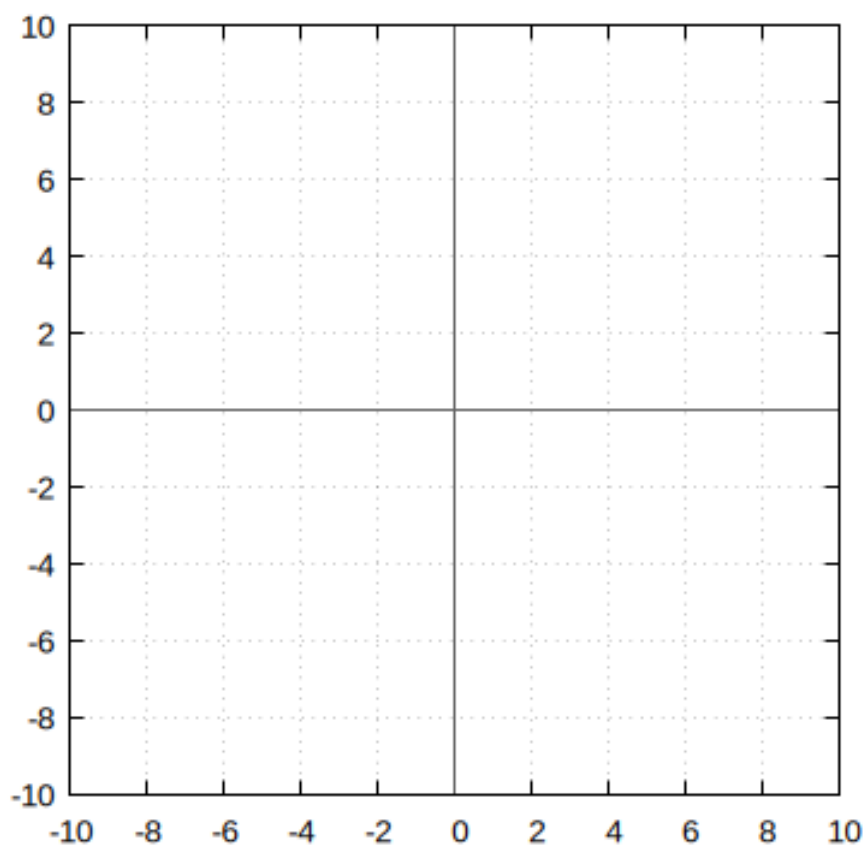
5) Let $f(x) = x^2 + 2x - 4$ and $g(x) = \frac{1}{x+1}$.

a) Evaluate $g(f(0))$

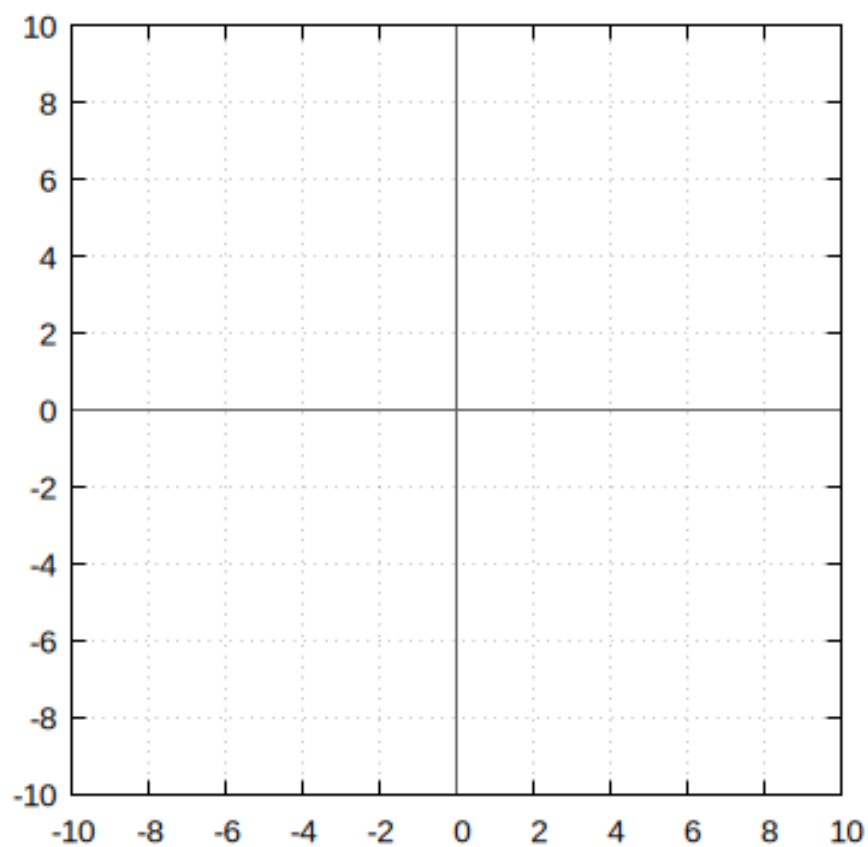
b) Evaluate $f(g(-2))$

6) Let $f(x) = x^2 + 3x$ and $g(x) = 2x - 5$. Determine an equation for each composite function and graph it.

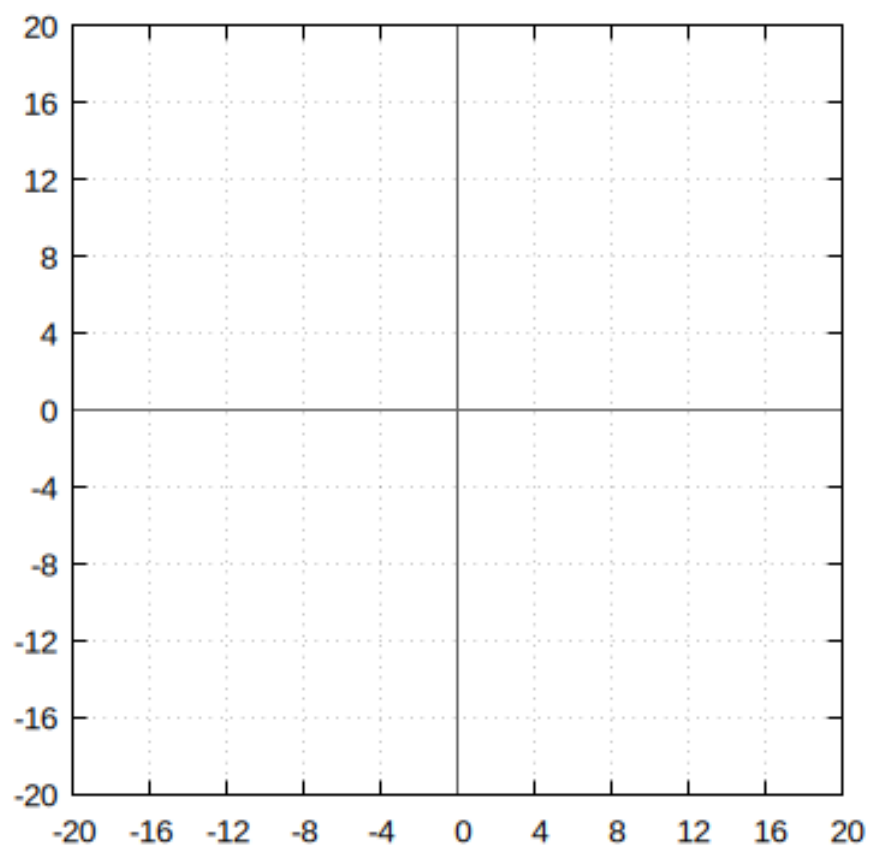
a) $y = f(g(x))$



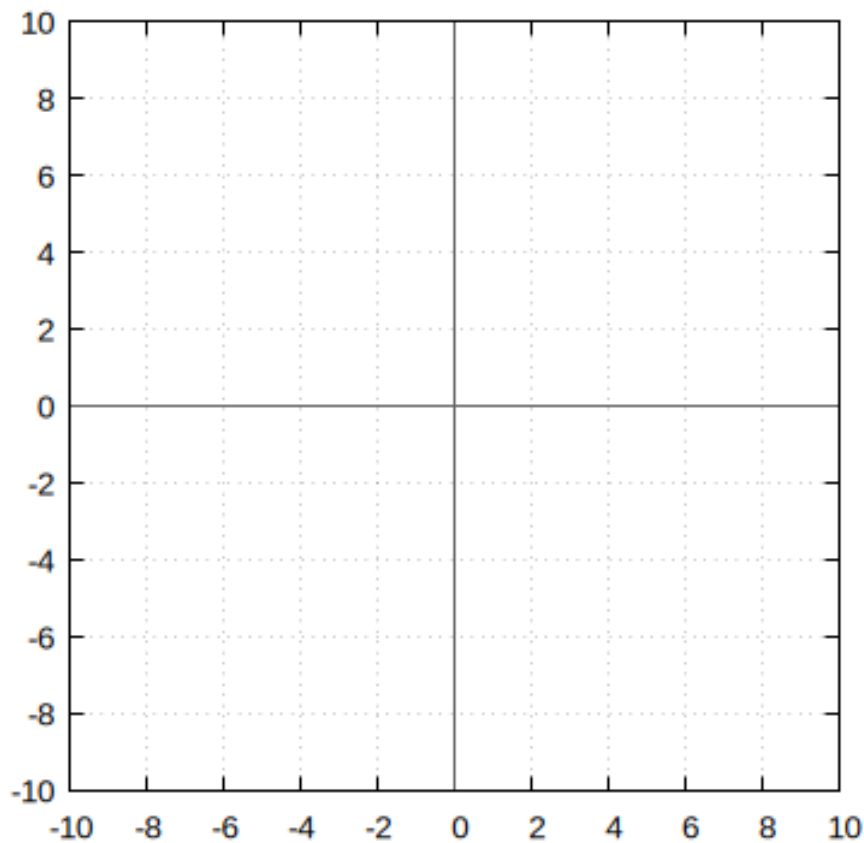
b) $y = g(f(x))$



c) $y = g(g(x))$



d) $y = g^{-1}(g(x))$



Answer Key

1) a) $h(x) = 5x - 2$, $h(2) = 8$ b) $k(x) = x - 8$, $k(2) = -6$

3) $h(x) = x^2 + 4x - 5 = (x + 5)(x - 1)$, vertex $(-2, -9)$

4) a) $y = (x - 2)^2(x + 2)$ b) $y = \frac{1}{x + 2}$, hole at $x = 2$ c) $y = x + 2$, hole at $x = 2$

5) a) $-\frac{1}{3}$ b) -5

6) a) $y = 2(2x - 5)(x - 1)$, vertex $(1.75, -2.25)$ b) $y = 2x^2 + 6x - 5$, vertex $(-1.5, -9.5)$ c) $y = 4x - 15$ d) $y = x$