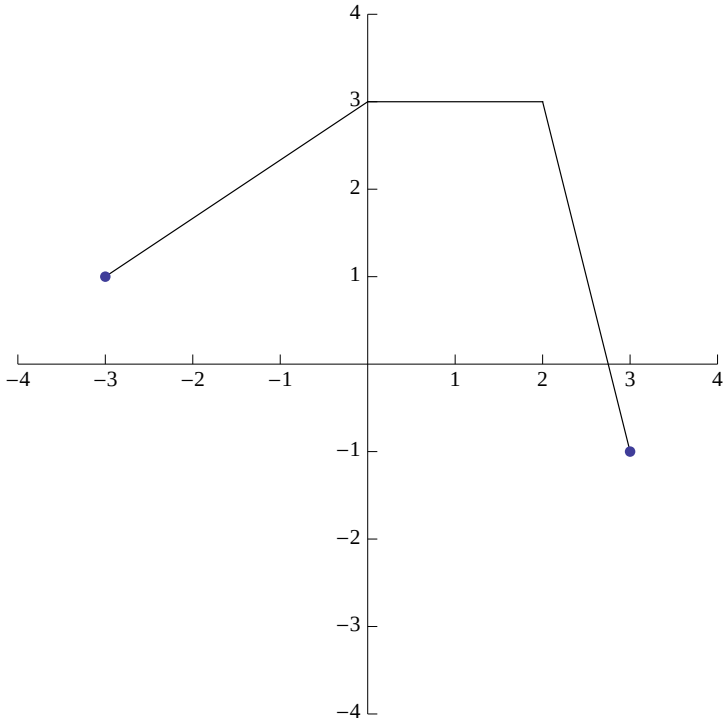
Math 29
PAL Worksheet 5

1. The following is the graph of a function f:



Graph each of the following functions:

a. $g(x) = f(x+1) - 2$.

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

c. $k(x) = f(2x)$

d. $l(x) = f(-x)$

e. $m(x) = -2f(x)$

2. Let $f(x) = 3x - 1$ and $g(x) = x^2 - x + 1$. Compute the values of $(f \circ g)(2)$, $(g \circ f)(2)$, $(g \circ g)(1)$ and $(f \circ f)(3)$.

3. Suppose that the graph of a function f contains the following three points:

$$(-2, 4),\ (0, -2),\ \text{and}\ (2, 7).$$

Find three points that are on the graphs of each of the following functions:

a. g, where g is obtained from f by shifting right 3 units.

b. h, where h is obtained from f by shifting down 4 units.

c. k, where k is obtained from f by reflecting in the x-axis.

d. l, where l is obtained from f by reflecting in the y-axis.

e. m, where m is obtained from f by stretching away from the x-axis by a factor of 3.

f. n, where n is obtained from f by compressing towards the x-axis by a factor of 3.

g. p, where p is obtained from f by stretching away from the y-axis by a factor of 4.

h. q, where q is obtained from f by compressing towards the y-axis by a factor of 4.

4. Let $f(x) = 3x - 1$ and $g(x) = x^2 - x + 1$. Find formulas for $(f \circ g)(x)$ and $(g \circ f)(x)$. State the domain of $f \circ g$ and the domain of $g \circ f$.

5. Let $f(x) = \dfrac{2x+3}{x-4}$ and $g(x) = \dfrac{x+1}{2x-1}$. Answer each question.

a. Is it possible to compute $(f \circ g)(\frac{1}{2})$? Explain.

b. Is it possible to compute $(f \circ g)(\frac{5}{7})$? Explain.

c. Is it possible to compute $(f \circ g)(4)$? Explain.

d. Is it possible to compute $(g \circ f)(\frac{1}{2})$? Explain.

e. Is it possible to compute $(g \circ f)(-\frac{10}{3})$? Explain.

6. Let $f(x) = \dfrac{3}{x-2}$ and $g(x) = \dfrac{2x-1}{2x+3}$. Find formulas for $(f \circ g)(x)$ and $(g \circ f)(x)$. State the domain of $f \circ g$ and the domain of $g \circ f$.