

Name:

Answer the questions in the spaces provided. If you run out of room for an answer, continue on the back of the page. Leave your answers in *exact form* or round to 4 decimal places.

1. Let  $f(x)$  be a function with domain  $0 \leq x \leq 5$  and range  $-6 \leq y \leq 6$ .

- (a) Write a function  $g(x)$  so that the graph of  $y = f(g(x))$  is the graph of  $y = f(x)$  shifted left by 3 units.

$$g(x) = x + 3$$

- (b) Write a function  $h(x)$  so that the graph of  $y = h(f(x))$  is the graph of  $y = f(x)$  shifted down by 7 units.

$$h(x) = x - 7$$

- (c) Compute the domain of  $f(5(x-21))$ .

$$0 \leq 5(x-21) \leq 5$$

$$\frac{0 \leq x-21 \leq 1}{21 \leq x \leq 22}$$

- (d) Compute the range of  $\frac{1}{3}f(x) - 2$

$$-6 \leq f(x) \leq 6$$

$$-2 \leq \frac{1}{3}f(x) \leq 2$$

$$-4 \leq \frac{1}{3}f(x) - 2 \leq 0$$