Name: *Key*

1. Let $f(x)$ be a function whose domain is $0 \leq x \leq 10$ and whose range is $-12 \leq y \leq 12$.

   (a) (5 points) Write a function, $g(x)$, so that this graph of the composition $f(g(x))$ will look like the graph of $f(x)$, shifted to the left by 6. State the domain and range of $f(g(x))$.

   $$\underline{g(x) = x + 6}$$

   Domain: $-6 \leq x \leq 4$ (shifted left 6)

   Range: $-12 \leq y \leq 12$ (unchanged)

   Fix a fn, -1 on (a). OK on rest

   Shift right -2

   $g(x) = f(x+6)$ -1

   (b) (5 points) Write a function, $h(x)$, so that the graph of the composition $h(f(x))$ will look like the graph of $f(x)$, shifted up by 13. State the domain and range of $h(f(x))$.

   $$h(x) = x + 13$$

   Domain $0 \leq x \leq 10$ (unchanged)

   Range $1 \leq x \leq 25$ (shifted up 13)

   $h(x) = f(x) + 13$ -1

(c) (5 points) Compute the domain of $f(5x - 8)$

$$0 \leq 5x - 8 \leq 10$$

$$8 \leq 5x \leq 18$$

$$\frac{8}{5} \leq x \leq \frac{18}{5}$$

(d) (5 points) Compute the range of $-\frac{1}{4}f(x) - 4$

$$-12 \leq f(x) \leq 12$$

$$3 \geq -\frac{1}{4}f(x) \geq -3$$

$$-1 \geq \frac{-1}{4}f(x) - 4 \geq -7$$

$$-1 \geq y \geq -7$$

forget to
flip...

 -1

Backwards?

 -3