

Warm Up:

Write the piecewise equation for the following.

Your monthly cellphone bill has a flat fee of \$25. If you talk up to 100 minutes it is \$0.10 per minute. If you talk more than 100 minutes it is \$0.15 per minute.

$$\textcircled{2} f(x) = 5x - 3 \quad g(x) = 2x^2$$

$$\text{a) } f(1)$$

$$\text{b) } g(-3)$$

$$\text{c) } f(g(-3))$$

$$\text{d) } g(f(1))$$

$$\text{e) } f(g(x))$$

$$\text{f) } g(f(x))$$

$$\text{g) } f^{-1}(x)$$

$$\text{h) } g^{-1}(x)$$

Warm-up

$$1) f(x) = \begin{cases} 25 + .10x & 0 < x \leq 100 \\ 25 + .15x & x > 100 \end{cases}$$

$$2) a. f(1) = 5(1) - 3 \\ = 5 - 3 \\ = \boxed{2}$$

$$b. g(-3) = 2(-3)^2 \\ = 2(9) \\ = \boxed{18}$$

$$c. f[g(-3)] \\ f[2(-3)^2] \\ f(18) \\ 5(18) - 3 \\ 90 - 3 \\ \boxed{87}$$

$$d. g[f(1)] \\ g[5(1) - 3] \\ g(2) \\ 2(2)^2 \\ \boxed{8}$$

$$e. f[g(x)] \\ f(2x^2) \\ 5(2x^2) - 3 \\ \boxed{10x^2 - 3}$$

$$f. g[f(x)] \\ g(5x - 3) \\ 2(5x - 3)^2 \\ 2(25x^2 - 30x + 9) \\ \boxed{50x^2 - 60x + 18}$$

$$g. f^{-1}(x) \\ y = 5x - 3 \\ \downarrow \quad \downarrow \\ x = \frac{y - 3}{5} \\ x + 3 = \frac{y}{5} \\ \frac{1}{5}x + \frac{3}{5} = y$$

$$\boxed{f^{-1}(x) = \frac{1}{5}x + \frac{3}{5}}$$

$$h. g^{-1}(x)$$

$$y = 2x^2 \\ x = \sqrt{\frac{y}{2}}$$

$$\pm \sqrt{\frac{x}{2}} = y$$

$$\boxed{g^{-1}(x) = \pm \sqrt{\frac{x}{2}}}$$