

1-8 Homework

Inverses in Context & Function Operations

- #1 To make a long-distance call, your phone company charges \$1.50 to make the connection, and an additional \$0.10 for every minute that you are on the line once connected.

- a. Write an equation for the price of a long-distance call, p , in terms of the length of the call in minutes, m :

$$P = 1.50 + 0.10m$$

- b. When you get the phone bill, you see that your sister made a long-distance call that cost \$2.75. How long was she on the phone?

$$2.75 = 1.5 + 0.1m$$

- c. Think about how you solved part (b). Write an equation to determine m in terms of p . (That is, how do you calculate the length of a call based on its price?)

$$m = \frac{p - 1.5}{0.1}$$

Operations on Functions

#2

$$f(x) = x^2 - 6x + 2$$

$$\text{Find } f(-2a) = (-2a)^2 - 6(-2a) + 2$$

$$= 4a^2 + 12a + 2$$

$$(-2x^2 + 4x + 10) - (3x^2 + 11x - 7)$$

$$= -5x^2 - 7x + 17$$

#3

$$f(x) = -2x^2 + 4x + 10$$

$$g(x) = 3x^2 + 11x - 7$$

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

$$f(x) = -2x^2 + 4x + 10$$

$$g(x) = 3x^2 + 11x - 7$$

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

$$(-2x^2 + 4x + 10) + (3x^2 + 11x - 7)$$

$$= x^2 + 15x + 3$$

#4

$$f(x) = -2x^2 + 4x + 10$$

$$g(x) = 3x^2 + 11x - 7$$

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

$$(-2x^2 + 4x + 10)(3x^2 + 11x - 7)$$

$$= -6x^4 - 11x^3 + 14x^2 + 12x^3 + 44x^2 - 28x^2 + 20x^3 + 10x - 70$$

#5

$$f(x) = -2x^2 + 4x + 10$$

$$g(x) = 3x^2 + 11x - 7$$

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

$$(-2x^2 + 4x + 10)(3x^2 + 11x - 7)$$

$$= x^2 + 15x + 3$$

#6

$$h(x) = 6x - 7$$

$$\text{Find } h(a+b)$$

$$= 6(a+b) - 7$$

$$= 6a + 6b - 7$$

#7

$$f(x) = x^2 - 6x + 2$$

$$g(x) = 9x - 1$$

$$\text{Find } 2f(x) - 3g(x)$$

$$2(x^2 - 6x + 2) - 3(9x - 1)$$

$$= 2x^2 - 12x + 4 - 27x + 3$$

$$= 2x^2 - 39x + 7$$

#8

$$f(x) = x^2 - 6x + 2$$

$$f(x) = 3x^2 - 4$$

$$\text{Find } 5[f(x+2)]$$

$$\begin{aligned} & (x^2 - 6x + 2) + (9x - 1) \\ & = x^2 + 3x + 1 \end{aligned}$$

$$\begin{aligned} & 5(3(x+2)^2 - 4) \\ & = 5(3(x^2 + 4x + 4) - 4) \\ & = 15x^2 + 60x + 40 \end{aligned}$$

#9

$$f(x) = 3x^2 - 4$$

$$\text{Find } (g \circ f)(-3x)$$

$$\begin{aligned} & 5(3(x+2)^2 - 4) \\ & = 5(3(x^2 + 4x + 4) - 4) \\ & = 15x^2 + 60x + 40 \end{aligned}$$

#10

$$\text{Let } f(x) = x - 5 \text{ and } g(x) = x^2$$

$$\text{Find } (g \circ f)(-3x)$$

$$\begin{aligned} & 5(3(x+2)^2 - 4) \\ & = 5(3(x^2 + 4x + 4) - 4) \\ & = 15x^2 + 60x + 40 \end{aligned}$$

#11

$$\text{Let } f(x) = x - 5 \text{ and } g(x) = x^2$$

$$\text{Find } (f \circ g)(-3x)$$

$$\begin{aligned} & 5(3(x+2)^2 - 4) \\ & = 5(3(x^2 + 4x + 4) - 4) \\ & = 15x^2 + 60x + 40 \end{aligned}$$

#12

$$\text{Let } f(x) = x^2 + 4 \text{ and } g(x) = 2x$$

$$\text{Find } (f \circ g)(-2)$$

$$\begin{aligned} & 5(3(x+2)^2 - 4) \\ & = 5(3(x^2 + 4x + 4) - 4) \\ & = 15x^2 + 60x + 40 \end{aligned}$$

#13

$$\text{Let } f(x) = x + 8 \text{ and } g(x) = 2x$$

$$\text{Find } (f \circ g)(4c)$$

$$\begin{aligned} & 5(3(x+2)^2 - 4) \\ & = 5(3(x^2 + 4x + 4) - 4) \\ & = 15x^2 + 60x + 40 \end{aligned}$$

#14

$$\text{Let } f(x) = x + 8 \text{ and } g(x) = 2x$$

$$\text{Find } (g \circ f)(4c)$$

$$\begin{aligned} & 5(3(x+2)^2 - 4) \\ & = 5(3(x^2 + 4x + 4) - 4) \\ & = 15x^2 + 60x + 40 \end{aligned}$$

#15

$$\text{Let } f(x) = x - 5 \text{ and } g(x) = x^2$$

$$\text{Find } (f \circ g)(3n)$$

$$\begin{aligned} & 5(3(x+2)^2 - 4) \\ & = 5(3(x^2 + 4x + 4) - 4) \\ & = 15x^2 + 60x + 40 \end{aligned}$$

#16

$$\text{Let } f(x) = x - 5 \text{ and } g(x) = x^2$$

$$\text{Find } (g \circ f)(3n)$$

$$\begin{aligned} & 5(3(x+2)^2 - 4) \\ & = 5(3(x^2 + 4x + 4) - 4) \\ & = 15x^2 + 60x + 40 \end{aligned}$$