

Building and Combining Functions

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Date: 10/23/14

Combining Functions

Given the functions $f(x) = 5x^2 + 3$ and $g(x) = 2x^2$

1. Find $g(x) \cdot f(x)$

$$2x^2(5x^2 + 3)$$

$$10x^4 + 6x^2$$

Given the functions $f(x) = 6x + 8$ and $g(x) = 5x - 12$

2. Find $f(x) + g(x)$.

$$6x + 8 + 5x - 12$$

$$11x - 4$$

3. Find $f(x) - g(x)$.

$$6x + 8 - (5x - 12)$$

$$6x + 8 - 5x + 12$$

$$x + 20$$

Given the functions $f(x) = 3x^2 + 5x - 8$ and $g(x) = 2x^2 + 4x - 9$

4. Find $f(x) + g(x)$.

$$3x^2 + 5x - 8 + 2x^2 + 4x - 9$$

$$5x^2 + 9x - 17$$

5. Find $f(x) - g(x)$.

$$3x^2 + 5x - 8 - (2x^2 + 4x - 9)$$

$$3x^2 + 5x - 8 - 2x^2 - 4x + 9$$

$$x^2 + x + 1$$

Given the functions $f(x) = 3^{7x}$ and $g(x) = 3^x$

6. Find $f(x) \cdot g(x)$.

$$3^{7x}(3^x)$$

$$3^{8x}$$

7. Find $f(x) / g(x)$.

$$\frac{3^{7x}}{3^x}$$

$$3^{6x}$$

8. Given $f(x) = 4$, $g(x) = x + 1$, and $h(x) = x$, find $j(x) = f(x) \cdot [g(x) + h(x)]$

$$4[(x+1) + x]$$

$$4(2x+1)$$

$$8x + 4$$

9. To raise funds, a club is publishing and selling a calendar. The club made \$500 in advertising and will make \$20 for each calendar sold. The cost of printing each calendar is \$6. Let c be the number of calendars to be printed and sold.

- a. Write a rule for the function $R(c)$, which gives the revenue generated by the sale of calendars.

$$R(c) = 500 + 20c$$

- b. Write a rule for the function $E(c)$, which gives the expense of printing the calendars.

$$E(c) = 6c$$

- c. Describe how the function $P(c)$, which gives the club's profit from the sale of the calendars, is related to $R(c)$ and $E(c)$. Then write a rule for $P(c)$.

$$P(c) = 500 + 20c - (6c)$$

$$P(c) = 500 + 14c$$

10. The student council has decided to sell t-shirts for a fundraiser. The printing company charges a \$75 set-up fee plus \$3 per shirt. The student council plans to sell their t-shirts for \$12 per shirt. Write a function $P(t)$ to represent the student council's profits.

- A) $P(t) = 12t$
B) $P(t) = 3t + 75$
C) $P(t) = 9t + 75$
D) $P(t) = 9t - 75$

$$R(t) = 12t$$

$$E(t) = 3t + 75$$

$$P(t) = (R - E)(t)$$

$$12t - (3t + 75)$$

$$12t - 3t - 75$$

$$\underline{P(t) = 9t - 75}$$