

8.3 Perform Function Operations and Composition of Functions

Operations on Functions: $f(x) = -4x$, $g(x) = 2x + 4$

Addition:

Subtraction:

Multiplication:

Division:

Power Functions:Ex1: $f(x) =$ $g(x) =$
Ex 2:Ex 3: $f(x) =$ $g(x) =$
Ex 4:Composition of a function:Ex 5: $f(x) =$ Ex 6: $g(x) =$

Ex 7:

$f(x) =$

$g(x) =$

Ex 8:

Ex 9:

$f(x) =$

$g(x) =$

Ex 10:

Ex 11:

Ex 12:

Ex 13:

Try These: $f(x) =$

$g(x) =$

1)

2)

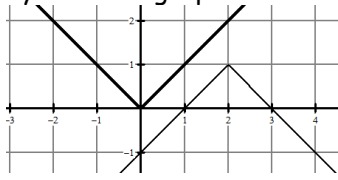
3)

4)

Summarize your notes:

Algebra Skillz

Below, the parent function $f(x) = |x|$ is represented by the bold graph.



Write the equation of the function represented by the thin graph.

4) $\frac{6}{\sqrt{32}}$

3) $\frac{\sqrt{12}}{2\sqrt{6}}$

5) Factor:
 $12b^3 - 56b^2 - 96b$

6) Factor and solve.
 $2x^2 - 15 = -7x$

8.3 Practice Problems

Directions: Let $f(x) = -3x^{1/3} + 4x^{1/2}$ and $g(x) = 5x^{1/3} + 4x^{1/2}$. Perform the indicated operation.

1) $f(x) + g(x)$

2) $g(x) - f(x)$

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

Directions: Let $f(x) = 2x^2$ and $g(x) = 5x - 4$. Perform the indicated operation.

4) $f(x) \cdot g(x)$

5) $\frac{f(x)}{g(x)}$

6) $f(x) - g(x)$

Directions: Let $f(x) = 3x - 2$ and $g(x) = 2x + 3$. Perform the indicated operation.

7) $f(x) \cdot g(x)$

8) $g(x) - f(x)$

9) $f(x) - g(x)$

Directions: Let $f(x) = 4x - 3$, $g(x) = -x^2$ and $h(x) = \frac{x-5}{2}$. Find the indicated value.

10) $f(g(2))$

11) $g(f(2))$

12) $g(h(-3))$

13) $h(f(2))$

14) $h(g(-4))$

15) $f(h(-8))$

Directions: Let $f(x) = 2x^2 - 3x$, $g(x) = 3x + 2$, and $h(x) = 2x - 9$. Find the indicated operation.

16) $f(g(x))$

17) $h(g(x))$

18) $g(f(x))$

Directions: Let $f(x) = x^2 - 3x$, $g(x) = 3x - 2$, and $h(x) = -x^2$. Find the indicated operation.

19) $f(g(x))$

20) $g(f(x))$

21) $f(h(x))$

8.3 Application and Extension

Directions: Let $f(x) = 3x^2 - x$, $g(x) = 2x + 6$ and $h(x) = -5x - 3$. Perform the indicated operation.

1) $g(x) \cdot h(x)$

2) $f(g(x))$

SAT PREP Below are sample SAT questions. The SAT is the main standardized test that colleges look at for admission. One is multiple choices; the other is free response where you must grid in your answer. Blow it up.

MULTIPLE CHOICE	GRID IN																																																
<p>If n and p are positive integers and $3^{n/p} = \sqrt[3]{81}$, then the product of n and p is:</p> <p>(A) -1 (B) 0 (C) 4 (D) 8 (E) 12</p>	<p>If $p^m \cdot p^6 = p^{30}$, and $(p^{-2})^n = p^{-42}$, what is the value of $m-n$?</p> <div style="border: 1px solid black; padding: 5px; margin: 5px auto; width: 100px; text-align: center;"> <table style="border-collapse: collapse; width: 100%;"> <tr> <td style="border: 1px solid black; width: 25px; height: 25px;"></td> <td style="border: 1px solid black; width: 25px; height: 25px; text-align: center;">/</td> <td style="border: 1px solid black; width: 25px; height: 25px; text-align: center;">/</td> <td style="border: 1px solid black; width: 25px; height: 25px;"></td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">•</td> <td style="border: 1px solid black; text-align: center;">•</td> <td style="border: 1px solid black; text-align: center;">•</td> <td style="border: 1px solid black; text-align: center;">•</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">0</td> <td style="border: 1px solid black; text-align: center;">0</td> <td style="border: 1px solid black; text-align: center;">0</td> <td style="border: 1px solid black; text-align: center;">0</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">1</td> <td style="border: 1px solid black; text-align: center;">1</td> <td style="border: 1px solid black; text-align: center;">1</td> <td style="border: 1px solid black; text-align: center;">1</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">2</td> <td style="border: 1px solid black; text-align: center;">2</td> <td style="border: 1px solid black; text-align: center;">2</td> <td style="border: 1px solid black; text-align: center;">2</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">3</td> <td style="border: 1px solid black; text-align: center;">3</td> <td style="border: 1px solid black; text-align: center;">3</td> <td style="border: 1px solid black; text-align: center;">3</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">4</td> <td style="border: 1px solid black; text-align: center;">4</td> <td style="border: 1px solid black; text-align: center;">4</td> <td style="border: 1px solid black; text-align: center;">4</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">5</td> <td style="border: 1px solid black; text-align: center;">5</td> <td style="border: 1px solid black; text-align: center;">5</td> <td style="border: 1px solid black; text-align: center;">5</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">6</td> <td style="border: 1px solid black; text-align: center;">6</td> <td style="border: 1px solid black; text-align: center;">6</td> <td style="border: 1px solid black; text-align: center;">6</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">7</td> <td style="border: 1px solid black; text-align: center;">7</td> <td style="border: 1px solid black; text-align: center;">7</td> <td style="border: 1px solid black; text-align: center;">7</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">8</td> <td style="border: 1px solid black; text-align: center;">8</td> <td style="border: 1px solid black; text-align: center;">8</td> <td style="border: 1px solid black; text-align: center;">8</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">9</td> <td style="border: 1px solid black; text-align: center;">9</td> <td style="border: 1px solid black; text-align: center;">9</td> <td style="border: 1px solid black; text-align: center;">9</td> </tr> </table> </div>		/	/		•	•	•	•	0	0	0	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9
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3) Globus Relief was founded in 1996 by successful business entrepreneurs devoted to helping those in need, with a mission to redirect useable health resources locally and globally. Globus Relief is a major force for good, creating a reliable humanitarian supply chain that has provided over \$200 million worth of soft medical goods, instrumentation, medical equipment and other health related products. The cost (in dollars) of making x medical apparatuses in a factory is modeled by the function $C(x) = 60x + 750$. The number of apparatuses produced in t hours is modeled by the function $x(t) = 50t$.

a) Find $C(x(t))$

b) Find $C(x(5))$. What does it represent?

4) Brust, Kelly and Bean each are making Algebra T-shirts. They believe that kids will want to buy them. Brust's profit in terms of t , t-shirts sold, is modeled by the function $B(t) = 3t^3 - 2t^2 + 123.3$. Kelly's profit in terms of t , t-shirts sold, is modeled by the function $K(t) = 2t + 23$ and Bean's profit in terms of t , t-shirts sold, is modeled by the function $S(t) = 2t^2 - 5t$. Kelly and Bean team up because Brust is killing them in profit.

a) Kelly believes if they work together their profit can be modeled by $H(t) = K(t) \cdot S(t)$. Find the new function.

b) Bean believes if they work together their profit will be modeled by $G(t) = K(t) + S(t)$. Find the new function.

c) Find $B(100)$, $G(100)$ and $H(100)$ to see which model will be the most profitable.