1 Given: $f(x) = 3x^2 + 2x$ & $g(x) = x$

Find: $h(x) = (f - g)(x)$

$3x^2 + 2x + 1$

$4x^2 + 2x$

$3x^2 + 3x$

$3x^2 + x$ ✓

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

Answer

2 Given: $f(x) = 3x^2 + 2x$ & $g(x) = x$

Find: $h(x) = \left(\frac{f}{g}\right)(x)$

$3x + 2x$

$3x + 2$

$\frac{3x^2 + 2x}{2}$

$\frac{1}{3x + 2}$

$3x \cdot \cancel{x}$

$\frac{3x^{\cancel{2}} + 2\cancel{x}}{\cancel{x}}$

Answer

3.

Combined Functions

You may also be asked to evaluate combined functions when given specific values for x.

Given $f(x) = (x-8)^2$ & $g(x) = x^3$, find:

(f * g)(5)

replace "x" with 5 every

input is a # → output is a #

$f(5) = (5-8)^2 = 9$

$g(5) = 5^3 = 125$

$(f*g)(5) = 9 \cdot 125$

$= 1125$

Answer

4.

If $f(x) = 2x+1$ & $g(x) = x^2$, create .

$h(x) = f(3x) \bullet g(2x)$

$(2(3x)+1) \bullet (2x)^2$

$(2x)(2x)$

$(6x+1) \bullet 4x^2$

$24x^3 + 4x^2$

Answer

5. If $f(x)=5x$ & $g(x)=\frac{1}{4x}$, which equation represents $h(x)=\frac{g(-x)}{f(2x)}$?

$h(x)=-\frac{5x}{2}$

$h(x)=-\frac{2x}{5x}$

$h(x)=\frac{1}{40x^2}$

$h(x)=-\frac{1}{40x^2}$

Answer

6. If $f(x)=3x+2$ & $g(x)=-2x+3$, which equation represents $h(x)=-2f(2x)-3g(3x)$?

$h(x)=-6x+35$

$h(x)=6x-35$

$h(x)=6x-13$

$h(x)=-6x+13$

Answer

7. If $f(x) = -2x$ & $g(x) = 4x$, create $h(x) = \dfrac{f(2x)}{3g(x)}$.
Is this equivalent to $\dfrac{x}{3}$?

Answer

8. If $f(x) = x^2 + 2$ & $g(x) = -x + 1$, create
$h(x) = 2g(-x) - f(2x)$. Is this equivalent to
$-4x^2 + 2x + 4$?

Answer

9. The functions f and g are defined by $f(x) = x^2$ & $g(x) = 2x$, respectively. Rewrite the function $h(x) = \dfrac{f(2x)g(-2x)}{2}$ in terms of x.

$h(x) = -4x^3$

$h(x) = -8x^3$

$h(x) = -2x^3$

$h(x) = 8x^3$

Answer

PARCC Sample Q

10. Given: $f(x) = 3x^2 + 2x$ & $g(x) = x$

Find: $h(x) = 2f(x) - xg(x)$

$6x^2 + 3x$

$4x^2 + 2x$

$6x^2 + x$

$5x^2 + 4x$

$f(x) = 3x^2 + 2x$ multiply all terms by 2

$2f(x) = 6x^2 + 4x$

$g(x) = x$

$x\,g(x) = x \cdot x = x^2$

$6x^2 + 4x - x^2$

Answer

Operations with Functions

12 $\left(\frac{3N}{2M}\right)(0)$

$N(x) = -3x+4$

$M(x) = 9x^3 - 1$

• replace x with (0)

$N(0) = -3(0)+4 = 4$

$M(0) = 9(0)^3 - 1 = -1$

$$\frac{3(\overset{N(0)}{4})}{2(\underset{M(0)}{-1})} = \frac{12}{-2} = \boxed{-6}$$

Oct 10-8:31 AM

Oct 8-12:49 PM

Composite Functions

Composite functions exist when one function is "nested" in the other function.

There are 2 ways of writing a composite function:

$$f(g(x)) \ or \ f \circ g(x)$$

Each form is read "f of g of x" and both mean the same thing.

Composite Functions

To simplify composite functions, substitute one function into the other in place of "x" and simplify. Work from the inside out.

Given: $f(x) = 3x^2 + 2x \ \ \& \ \ g(x) = 4x$

Find: $f(g(x))$

Answer

Composite Functions

To simplify composite functions, substitute one function into the other in place of "x" and simplify. Work from the inside out.

2.

Given: $f(x) = 3x^2 + 2x$ & $g(x) = 4x$

Find: $g(f(x))$

Answer

Composite Functions

3.

Given: $f(x) = x - 3$ & $g(x) = 2x^2 + x - 2$

Find: $f(g(x))$

Answer

Composite Functions

4. Given: $f(x) = x - 3$ & $g(x) = 2x^2 + x - 2$

Find: $g \circ f(x)$

Answer

5. Find $f \circ g(x)$ if $f(x) = x^2 + x + 4$ & $g(x) = \sqrt{x}$

$x + \sqrt{x+4}$

$\sqrt{x^2 + x} + 2$

$x + \sqrt{x} + 2$

$x + \sqrt{x} + 4$

Answer

6. Find $f \circ g(x)$ if $f(x) = x^2$ & $g(x) = \sqrt{x^2 + 4}$

$x^2 + 4$

$x^2 + 2$

$\sqrt{x^4 + 4}$

$\sqrt{6x}$

Answer

Composite Functions

To simplify composite functions with numerical values, there are two different options:
1) substitute the number into the "inner" function, simplify, and then substitute that value in for the variable in the "outer" function.
2) find your composite function & then substitute the numerical value into the composite function.

If $f(x) = x^2 - 4x$ & $g(x) = 3x + 2$, then find $f(g(1))$.

Option 1)

$g(1) = 3(1) + 2 = 5$

$f(g(1)) = f(5)$

$= 5^2 - 4(5)$

$= 25 - 20 = 5$

Option 2)

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

$= 9x^2 + 12x + 4 - 12x - 8$

$= 9x^2 - 4$

$f(g(1)) = 9(1)^2 - 4 = 5$

Composite Functions

7. Given: $f(x) = 3x^2 + 2x$ & $g(x) = 4x$

Find: $f \circ g(3)$

Answer

Composite Functions

8. Given: $f(x) = 3x^2 + 2x$ & $g(x) = 4x$

Find: $g(f(-2))$

Answer

9. If $f(x) = x^2 + 1$ & $g(x) = 3x - 1$, find the value of $f(g(2))$

Answer

Composite Functions

10. If $f(x) = x + 2$ & $g(x) = \frac{1}{x}$, find the value of $g(f(-2))$

$\frac{5}{2}$

$\frac{1}{2}$

Answer

Composite Functions

11. If $f(x) = 3x^2 + 2x - 3$ & $g(x) = x - 2$, find the value of $f(g(-3))$

Answer

Challenge: If $f(x) = x + 1$, $g(x) = 3x - 1$ & $h(x) = |x|$, find the value of $f \circ h \circ g(0)$

Answer

Sep 22-6:55 PM