

Topic: Combinations of functions**Question:** Find $(f \cdot g)(x)$.

$$f(x) = 2x^2 + 5$$

$$g(x) = x + 2$$

Answer choices:

A $2x^3 + 5x^2 + 4x + 10$

B $2x^3 + 3x^2 + 3x + 10$

C $2x^3 + 4x^2 + 5x + 10$

D $2x^3 + 10x^2 + 10x + 10$



Solution: C

The combination $(f \cdot g)(x)$ is the same as the product $f(x) \cdot g(x)$. Therefore,

$$(f \cdot g)(x) = (2x^2 + 5)(x + 2)$$

We can find this product using the FOIL method.

$$(f \cdot g)(x) = 2x^3 + 4x^2 + 5x + 10$$



Topic: Combinations of functions**Question:** Find $(f - g)(x)$.

$$f(x) = 2x^2 + 6x - 3$$

$$g(x) = 3x^2 - 5x - 2$$

Answer choices:

A $-x^2 + 11x - 1$

B $x^2 + x - 5$

C $-x^2 + 11x - 5$

D $-x^2 + x - 1$



Solution: A

The combination $(f - g)(x)$ is the same as the difference $f(x) - g(x)$.

Therefore,

$$(f - g)(x) = (2x^2 + 6x - 3) - (3x^2 - 5x - 2)$$

$$(f - g)(x) = 2x^2 + 6x - 3 - 3x^2 - (-5x) - (-2)$$

$$(f - g)(x) = 2x^2 + 6x - 3 - 3x^2 + 5x + 2$$

$$(f - g)(x) = -x^2 + 11x - 1$$



Topic: Combinations of functions

Question: The domain of $(f/g)(x)$ is all real numbers, except what?

$$f(x) = x^2 - 9$$

$$g(x) = 2x - 6$$

Answer choices:

A 6

B 3

C 0

D -3



Solution: B

The function

$$\left(\frac{f}{g}\right)(x)$$

is the same as the quotient

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

The domain of

$$\frac{x^2 - 9}{2x - 6}$$

is all real numbers except those that make the denominator 0.

$$2x - 6 = 0 \quad \rightarrow \quad 2x = 6 \quad \rightarrow \quad x = 3$$

So the only real number that isn't in the domain is 3.

