

Answer on Question #55752 – Math - Algebra

Arithmetic Functions

1. If $f(x) = 8x$ and $g(x) = 2x+1$, find $(f \circ g)(x)$.

- A. $10x + 1$
- B. $16x + 1$
- C. $16x + 8$
- D. $16x^2 + 8x$

Solution

$$(f \circ g)(x) = f(g(x)) = 8(2x+1) = 16x + 8$$

Answer: C. $16x + 8$

2. If $h(x) = (f \circ g)(x)$ and $h(x) = 3(x + 2)^2$, find $f(x)$ and $g(x)$.

- A. $f(x) = 3x^2$ $g(x) = (x + 2)^2$
- B. $f(x) = x + 2$ $g(x) = 3x^2$
- C. $f(x) = (x + 2)^2$ $g(x) = 3x^2$
- D. $f(x) = 3x^2$ $g(x) = x + 2$

Solution

If $h(x) = 3(x + 2)^2$, $h(x) = (f \circ g)(x) = f(g(x))$, then take

$$f(x) = 3x^2 \quad g(x) = x + 2$$

Answer: D. $f(x) = 3x^2$, $g(x) = x + 2$.

3. For $f(x) = 3x + 1$ and $g(x) = x^2 - 6$, find $(f + g)(x)$

- A. $3x^2 - 17$
- B. $3x^2 - 5$
- C. $x^2 + 3x - 5$
- D. $x^2 + 3x + 7$

Solution

$$(f + g)(x) = 3x + 1 + x^2 - 6 = x^2 + 3x - 5$$

Answer: C. $x^2 + 3x - 5$

4. For $f(x) = 2x + 1$ and $g(x) = x^2 - 7$, find $(f - g)(x)$

- A. $-x^2 + 2x + 8$
- B. $2x^2 - 15$
- C. $x^2 - 2x - 8$
- D. $-x^2 + 2x - 6$

$$(f - g)(x) = 2x + 1 - (x^2 - 7) = 2x + 1 - x^2 + 7 = -x^2 + 2x + 8$$

Answer: A. $-x^2 + 2x + 8$

5. For $f(x) = 4x + 1$ and $g(x) = x^2 - 5$, find $(f \circ g)(x)$.

- A. $4x^3 + x^2 - 5x - 5$
- B. $4x^3 + x^2 - 20x - 5$
- C. $4x^2 - 19$
- D. $4x^3 + x^2 - 4x - 6$

Solution

$$(f \circ g)(x) = f(g(x)) = 4(x^2 - 5) + 1 = 4x^2 - 20 + 1 = 4x^2 - 19.$$

Answer: C. $4x^2 - 19$