

7.1 - 7.2 Practice Alg 2 Trig

Given $f(x) = 4x - 1$ and $g(x) = x + 7$

Find:

1) $(f + g)(x) = \underline{5x + 6}$

2) $(f - g)(x) = \underline{3x - 8}$

3) $(f \cdot g)(x) = \underline{4x^2 + 27x - 7}$
 $(4x - 1)(x + 7)$
 $4x^2 + 28x - x - 7$

4) $\left(\frac{g}{f}\right)(x) = \underline{\frac{x + 7}{4x - 1}, x \neq \frac{1}{4}}$

Find each composition:

5) $(f \circ g)(x) = \underline{4x + 27}$

$$f(x + 7) = 4(x + 7) - 1$$

$$= 4x + 28 - 1$$

6) $(g \circ f)(-5) = \underline{-14}$

$$f(-5) = -21$$

$$g(-21) = -21 + 7$$

7) Given the original function $f(x) = \frac{1}{4}x + 6$, what is its inverse?

$$x = \frac{1}{4}y + 6$$

$$x - 6 = \frac{1}{4}y$$

$$4x - 24 = y$$

$$f^{-1}(x) = 4x - 24$$

8) Are the following functions inverses of each other?

$$f(x) = 2x - 8 \quad \text{and} \quad g(x) = \frac{1}{2}x + 4$$

$$\begin{aligned} f(g(x)) &= 2\left(\frac{1}{2}x + 4\right) - 8 \\ &= x + 8 - 8 \\ &= \boxed{x} \end{aligned}$$

$$\begin{aligned} g(f(x)) &= \frac{1}{2}(2x - 8) + 4 \\ &= x - 4 + 4 \\ &= \boxed{x} \end{aligned}$$

Yes, they are inverses