

Name _____

Date _____

Year Group _____

Find $(f \circ g)(x)$ and $g \circ f(x)$ where $f(x) = 4x - 2$ and $g(x) = 2x^2 + 1$

1. $(f \circ g)(x)$

$$f(g(x))$$

$$\begin{aligned} \text{Steps} = & f((2x^2 + 1)) \\ & \underline{\hspace{1cm}} (2x^2 + 1) - 2 \\ & 8x^2 + \underline{\hspace{1cm}} - 2 \end{aligned}$$

$$\text{Answer} = \underline{\hspace{1cm}} x^2 + \underline{\hspace{1cm}}$$

2. $(g \circ f)(x)$

$$g(f(x))$$

$$\begin{aligned} \text{Steps} = & g((4x - 2)) \\ & 2(\underline{\hspace{1cm}})^2 + 1 \\ & 2(4x - 2)(\underline{\hspace{1cm}}) + 1 \end{aligned}$$

$$\begin{aligned} & (\underline{\hspace{1cm}} x - 4)(4x - 2) + \underline{\hspace{1cm}} \\ & \underline{\hspace{1cm}} x^2 - 16x - \underline{\hspace{1cm}} x + 8 + 1 \end{aligned}$$

$$\text{Answer} = \underline{\hspace{1cm}} x^2 - 32x + \underline{\hspace{1cm}}$$

Find $(f \circ g)(x)$ and $g \circ f(x)$ where $f(x) = 3x + 1$ and $g(x) = -2x^2 - 4$

3. $(f \circ g)(x)$

$$\text{Steps} \Rightarrow (f \circ g)(x) = f(\underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}})$$

$$\text{Answer} \Rightarrow \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}}$$

4. $(g \circ f)(x)$

$$\text{Steps} \Rightarrow (g \circ f)(x) = g(\underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}})$$

$$\text{Answer} \Rightarrow \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}}$$