Exercise 77

For the following exercises, use the functions $f(x) = 2x^2 + 1$ and $g(x) = 3x + 5$ to evaluate or find the composite function as indicated.

$$f(g(x))$$

Solution

Plug the formula for $g(x)$ where x is in the formula for $f(x)$ and expand the result.

$$
\begin{aligned}
f(g(x)) &= 2(3x + 5)^2 + 1 \\
&= 2(9x^2 + 30x + 25) + 1 \\
&= 18x^2 + 60x + 50 + 1 \\
&= 18x^2 + 60x + 51
\end{aligned}
$$