

1. Find the average rate of change of the function $f(x) = 2x^2 + x$ over the interval $x = 1$ to $x = 3$. (Simplify your answer.)
2. Find an expression for the average rate of change of the function $g(x) = \sin(x)$ over the interval $x = a$ to $x = a + h$. (You do not need to do very much simplification here.)

#1

$$\frac{f(3) - f(1)}{3 - 1} = \frac{2(3)^2 + 3 - (2(1)^2 + 1)}{2}$$
$$= \frac{18 + 3 - 3}{2} = \frac{18}{2} = 9$$

#2

$$\frac{\sin(a+h) - \sin(a)}{h}$$