

Exercise 6

For the following exercises, find the average rate of change of each function on the interval specified for real numbers b or h .

$$g(x) = 2x^2 - 9 \text{ on } [4, b]$$

Solution

The average rate of change of the function on $[4, b]$ is

$$\begin{aligned}\frac{g(b) - g(4)}{b - 4} &= \frac{[2(b)^2 - 9] - [2(4)^2 - 9]}{b - 4} \\ &= \frac{(2b^2 - 9) - [2(16) - 9]}{b - 4} \\ &= \frac{(2b^2 - 9) - (32 - 9)}{b - 4} \\ &= \frac{2b^2 - 9 - 32 + 9}{b - 4} \\ &= \frac{2b^2 - 32}{b - 4} \\ &= \frac{2(b^2 - 16)}{b - 4} \\ &= \frac{2(b + 4)(b - 4)}{b - 4} \\ &= 2(b + 4).\end{aligned}$$