

Exercise 61

Let f and g be linear functions with equations $f(x) = m_1x + b_1$ and $g(x) = m_2x + b_2$. Is $f \circ g$ also a linear function? If so, what is the slope of the graph?

Solution

Let

$$\begin{aligned}f(x) &= m_1x + b_1 \\g(x) &= m_2x + b_2.\end{aligned}$$

Then

$$f \circ g = f(g(x)) = m_1(m_2x + b_2) + b_1 = m_1m_2x + m_1b_2 + b_1,$$

which means $f \circ g$ is also a linear function. The slope of the graph is m_1m_2 .