

Exercise 6

Given $f(x) = -3x^2 + x$ and $g(x) = 5$, find $f + g$, $f - g$, fg , and $\frac{f}{g}$. Determine the domain for each function in interval notation.

Solution

Determine each of the functions.

$$f + g = f(x) + g(x) = (-3x^2 + x) + (5) = -3x^2 + x + 5$$

$$f - g = f(x) - g(x) = (-3x^2 + x) - (5) = -3x^2 + x - 5$$

$$fg = f(x)g(x) = (-3x^2 + x)(5) = -15x^2 + 5x$$

$$\frac{f}{g} = \frac{f(x)}{g(x)} = \frac{-3x^2 + x}{5} = \frac{-3x^2}{5} + \frac{x}{5} = -\frac{3}{5}x^2 + \frac{1}{5}x$$

The domain of $f + g$, $f - g$, fg , and f/g is $(-\infty, \infty)$ because each is a polynomial.