Exercise 318

Find the degree, y-intercept, and zeros for the following polynomial functions.

$$f(x) = 2x^2 + 9x - 5$$

Solution

The degree is the highest power of x in the polynomial.

$$\text{Degree: } 2$$

The y-intercept is the point where the curve crosses the y-axis. To find the y-value, plug in $x = 0$.

$$f(0) = 2(0)^2 + 9(0) - 5 = -5$$

Therefore, the y-intercept is $(0, -5)$. The zeros are values of x where $f(x) = 0$.

$$f(x) = 2x^2 + 9x - 5 = 0$$

$$(2x - 1)(x + 5) = 0$$

$$2x - 1 = 0 \quad \text{or} \quad x + 5 = 0$$

$$2x = 1 \quad \text{or} \quad x = -5$$

$$x = \frac{1}{2} \quad \text{or} \quad x = -5$$

The zeros are then

$$x = \left\{-5, \frac{1}{2}\right\}.$$