Exercise 57

For the following exercises, use the given information about the polynomial graph to write the equation.

Degree 3. Zeros at $x = -2$, $x = 1$, and $x = 3$. y-intercept at $(0, -4)$.

Solution

Based on the zeros, the model polynomial function is

$$f(x) = A(x + 2)(x - 1)(x - 3).$$

Use the provided point, the y-intercept, to determine A.

$$-4 = A(0 + 2)(0 - 1)(0 - 3) \quad \rightarrow \quad -4 = A(6) \quad \rightarrow \quad A = -\frac{2}{3}$$

Therefore,

$$f(x) = -\frac{2}{3}(x + 2)(x - 1)(x - 3).$$