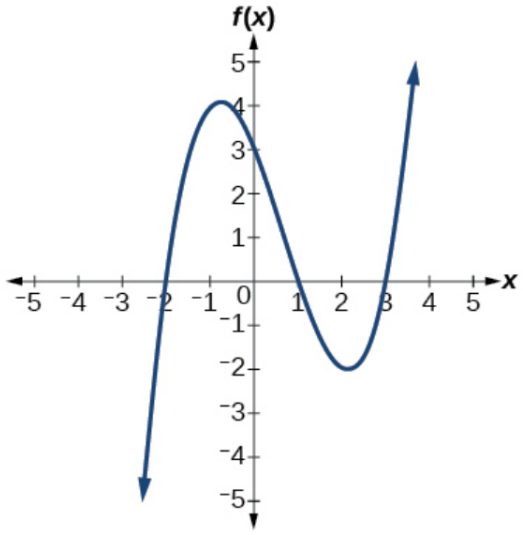
Exercise 48

For the following exercises, use the graphs to write the formula for a polynomial function of least degree.



Solution

Notice where the graph crosses the x-axis: The zeros are $x = -2$, $x = 1$, and $x = 3$. The model equation of the polynomial function is

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

To determine A, use a known point on the graph, for example, the y-intercept $(0, 3)$.

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

Therefore,

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