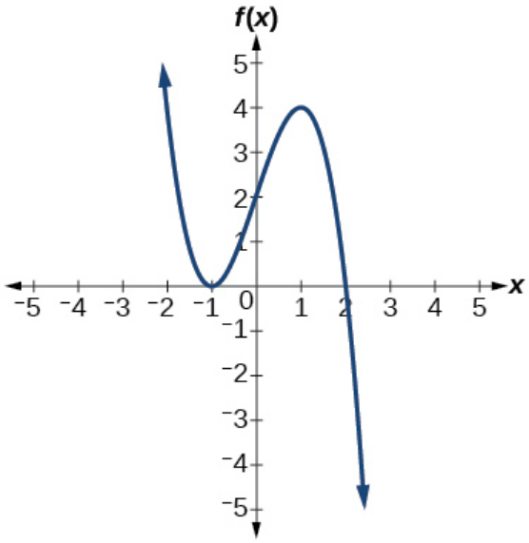
Exercise 50

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 $x = -1$ and $x = 2$. The model equation of the polynomial function is

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

The multiplicity of $x = -1$ is even (2 at least) because the graph bounces back here. To determine A, use a known point on the graph, for example, the y-intercept $(0, 2)$.

$$2 = A(0+1)^2(0-2) \quad \rightarrow \quad 2 = A(-2) \quad \rightarrow \quad A = -1$$

Therefore,

$$f(x) = -(x+1)^2(x-2).$$