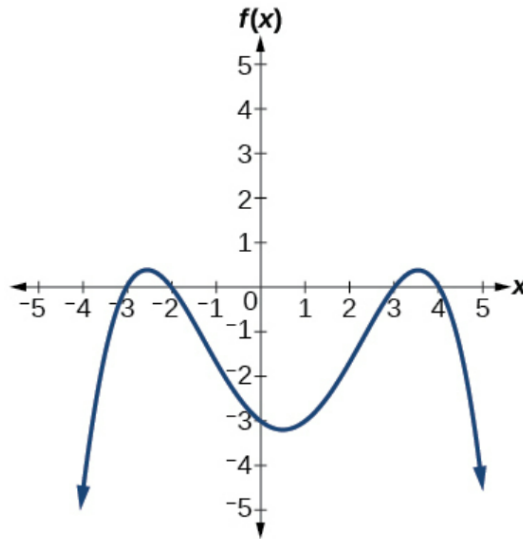


Exercise 52

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 $x = -3$, $x = -2$, $x = 3$, and $x = 4$. The model equation of the polynomial function is

$$f(x) = A(x + 3)(x + 2)(x - 3)(x - 4).$$

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

$$-3 = A(0 + 3)(0 + 2)(0 - 3)(0 - 4) \quad \rightarrow \quad -3 = A(72) \quad \rightarrow \quad A = -\frac{1}{24}$$

Therefore,

$$f(x) = -\frac{1}{24}(x + 3)(x + 2)(x - 3)(x - 4).$$