Exercise 61

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

Degree 5. Double zero at $x = 1$, and triple zero at $x = 3$. Passes through the point $(2, 15)$.

Solution

Based on the zeros and multiplicities, the model polynomial function is

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

Use the provided point $(2, 15)$ to determine A.

$$15 = A(2 - 1)^2(2 - 3)^3 \quad \rightarrow \quad 15 = A(-1) \quad \rightarrow \quad A = -15$$

Therefore,

$$f(x) = -15(x - 1)^2(x - 3)^3.$$