

## Exercise 60

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

Degree 4. Root of multiplicity 2 at  $x = 4$ , and a roots of multiplicity 1 at  $x = 1$  and  $x = -2$ .  
 $y$ -intercept at  $(0, -3)$ .

### Solution

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

$$f(x) = A(x + 2)(x - 1)(x - 4)^2.$$

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

$$-3 = A(0 + 2)(0 - 1)(0 - 4)^2 \rightarrow -3 = A(32) \rightarrow A = -\frac{3}{32}$$

Therefore,

$$f(x) = -\frac{3}{32}(x + 2)(x - 1)(x - 4)^2.$$

