

## Exercise 32

For the following exercises, find the zeros and give the multiplicity of each.

$$f(x) = x^3(x - 1)^3(x + 2)$$

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### Solution

To find the zeros, set  $f(x) = 0$  and solve the equation for  $x$ .

$$x^3(x - 1)^3(x + 2)^1 = 0$$

$$x^3 = 0 \quad \text{or} \quad (x - 1)^3 = 0 \quad \text{or} \quad x + 2 = 0$$

$$x = 0 \quad \text{or} \quad x - 1 = 0 \quad \text{or} \quad x = -2$$

$$x = 0 \quad \text{or} \quad x = 1 \quad \text{or} \quad x = -2$$

The multiplicity of  $x = 0$  is **3**, the multiplicity of  $x = 1$  is **3**, and the multiplicity of  $x = -2$  is **1**.