

## Exercise 37

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

$$f(x) = x^6 - x^5 - 2x^4$$

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### Solution

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

$$x^6 - x^5 - 2x^4 = 0$$

$$x^4(x^2 - x - 2) = 0$$

$$x^4(x - 2)^1(x + 1)^1 = 0$$

$$x^4 = 0 \quad \text{or} \quad x - 2 = 0 \quad \text{or} \quad x + 1 = 0$$

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

The multiplicity of  $x = 0$  is 4, the multiplicity of  $x = 2$  is 1, and the multiplicity of  $x = -1$  is 1.