

Exercise 15

For the following exercises, find the x - or t -intercepts of the polynomial functions.

$$f(x) = x^3 + x^2 - 4x - 4$$

Solution

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

$$x^3 + x^2 - 4x - 4 = 0$$

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

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

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

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

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

Therefore, the x -intercepts are $(-2, 0)$ and $(-1, 0)$ and $(2, 0)$.

