

Exercise 18

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

$$f(x) = x^6 - 7x^3 - 8$$

Solution

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

$$x^6 - 7x^3 - 8 = 0$$

$$(x^3 - 8)(x^3 + 1) = 0$$

$$x^3 - 8 = 0 \quad \text{or} \quad x^3 + 1 = 0$$

$$x^3 = 8 \quad \text{or} \quad x^3 = -1$$

$$\sqrt[3]{x^3} = \sqrt[3]{8} \quad \text{or} \quad \sqrt[3]{x^3} = \sqrt[3]{-1}$$

$$x = 3 \quad \text{or} \quad x = -1$$

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

