

Exercise 17

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

$$f(x) = 2x^3 - x^2 - 8x + 4$$

Solution

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

$$2x^3 - x^2 - 8x + 4 = 0$$

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

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

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

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

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

Therefore, the x -intercepts are $(-2, 0)$ and $(\frac{1}{2}, 0)$ and $(2, 0)$.

