

Exercise 27

For the following exercises, find the intercepts of the functions.

$$f(x) = x^4 - 16$$

Solution

In order to find the y -intercept, set $x = 0$.

$$f(0) = 0^4 - 16 = -16$$

Therefore, the y -intercept is $(0, -16)$. To find the x -intercept(s), set $y = 0$ and solve the equation for x .

$$x^4 - 16 = 0$$

$$x^4 = 16$$

Take the fourth root of both sides.

$$\sqrt[4]{x^4} = \sqrt[4]{16}$$

Since there's an even power under an even root and the result is to an odd power, an absolute value sign is needed around x .

$$|x| = 2$$

Remove the absolute value sign by placing \pm on the opposite side.

$$x = \pm 2$$

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

