

Exercise 28

For the following exercises, find the x - and y -intercepts of the graphs of each function.

$$f(x) = -2|x + 1| + 6$$

Solution

Find the y -intercept first by plugging in $x = 0$.

$$f(0) = -2|0 + 1| + 6 = -2(1) + 6 = 4$$

Therefore, the y -intercept is $(0, 4)$. Now find the x -intercepts by setting $f(x) = 0$ and solving the equation for x .

$$f(x) = -2|x + 1| + 6 = 0$$

Isolate the absolute value term. Start by subtracting 6 from both sides.

$$-2|x + 1| = -6$$

Divide both sides by -2 .

$$|x + 1| = 3$$

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

$$x + 1 = \pm 3$$

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

$$x = 2 \quad \text{or} \quad x = -4$$

Therefore, the x -intercepts are $(2, 0)$ and $(-4, 0)$.

