Exercise 25

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

$$f(x) = 2|x+1| - 10$$

Solution

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

$$f(0) = 2|0+1| - 10 = 2(1) - 10 = -8$$

Therefore, the y-intercept is $(0, -8)$. Now find the x-intercepts by setting $f(x) = 0$ and solving the equation for x.

$$f(x) = 2|x+1| - 10 = 0$$

Isolate the absolute value term. Start by adding 10 to both sides.

$$2|x+1| = 10$$

Divide both sides by 2.

$$|x+1| = 5$$

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

$$x+1 = \pm 5$$

$$x+1 = 5 \quad \text{or} \quad x+1 = -5$$

$$x = 4 \quad \text{or} \quad x = -6$$

Therefore, the x-intercepts are $(4, 0)$ and $(-6, 0)$.