Exercise 22

For the following exercises, solve the equations below and express the answer using set notation.

$$\left|\frac{1}{2}x - 5\right| = 11$$

Solution

Remove the absolute value sign by placing $\pm$ (read as "plus or minus") on the right side.

$$\frac{1}{2}x - 5 = \pm 11$$

$$\frac{1}{2}x - 5 = 11 \quad \text{or} \quad \frac{1}{2}x - 5 = -11$$

$$\frac{1}{2}x = 16 \quad \text{or} \quad \frac{1}{2}x = -6$$

$$x = 32 \quad \text{or} \quad x = -12$$

Therefore,
$$x = \{-12, 32\}.$$