

Exercise 19

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

$$2|x - 3| + 1 = 2$$

Solution

Isolate the absolute value term. Start by subtracting 1 from both sides.

$$2|x - 3| = 1$$

Divide both sides by 2.

$$|x - 3| = \frac{1}{2}$$

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

$$x - 3 = \pm \frac{1}{2}$$

$$x - 3 = \frac{1}{2} \quad \text{or} \quad x - 3 = -\frac{1}{2}$$

$$x = 3 + \frac{1}{2} \quad \text{or} \quad x = 3 - \frac{1}{2}$$

$$x = \frac{7}{2} \quad \text{or} \quad x = \frac{5}{2}$$

Therefore,

$$x = \left\{ \frac{5}{2}, \frac{7}{2} \right\}.$$