Exercise 35

For the following exercises, solve each inequality and write the solution in interval notation.

$$\left|\frac{3}{4}x - 5\right| \geq 7$$

Solution

Remove the absolute value sign by breaking up the inequality into two; using the logical operators, "and" or "or," if you have $<$ or $>$, respectively; and solving for x.

$$\left|\frac{3}{4}x - 5\right| \geq 7$$

$$\frac{3}{4}x - 5 \geq 7 \quad \text{or} \quad \frac{3}{4}x - 5 \leq -7$$

$$\frac{3}{4}x \geq 12 \quad \text{or} \quad \frac{3}{4}x \leq -2$$

$$3x \geq 48 \quad \text{or} \quad 3x \leq -8$$

$$x \geq 16 \quad \text{or} \quad x \leq -\frac{8}{3}$$

Therefore,

$$x \in \left(-\infty, -\frac{8}{3}\right] \cup [16, \infty).$$