

SOLVE A 1-VARIABLE ABSOLUTE VALUE INEQUALITY

PROBLEM

$$\text{Solve: } 5|x + 2| < 3$$

STEP 1

Divide both sides of the inequality by 5.

$$5|x + 2| < 3$$

$$\frac{\cancel{5}|x + 2|}{\cancel{5}} < \frac{3}{5}$$

$$|x + 2| < \frac{3}{5}$$

STEP 2

Recall how to solve an absolute value inequality that has a less than sign.

$$|a| < b \text{ is equivalent to the compound inequality } -b < a < b.$$

STEP 3

Rewrite the inequality in the problem in the form $-b < a < b$.

$$|x + 2| < \frac{3}{5} \text{ is equivalent to the compound inequality } -\frac{3}{5} < x + 2 < \frac{3}{5}.$$

STEP 4

Solve for x . Subtract 2 from each part of the compound inequality in Step 2, and simplify the result.

$$-\frac{3}{5} < x + 2 < \frac{3}{5}$$

$$-\frac{3}{5} - 2 < x + 2 - 2 < \frac{3}{5} - 2$$

$$-\frac{3}{5} - \frac{10}{5} < x < \frac{3}{5} - \frac{10}{5}$$

$$-\frac{13}{5} < x < -\frac{7}{5}$$

ANSWER

$$-\frac{13}{5} < x < -\frac{7}{5}$$