Write an absolute value inequality for each graph.

26. Write a compound inequality from the graph. Then determine what can be added or subtracted from each term so that it is in the form $x < -a$ or $x > a$. This implies that $|x + c| > a$. 

- $x < -1$ or $x > 3$
- $x - 1 < -2$ or $x - 1 > 2$
This implies:

\[ |x - 1| > 2 \]

28. Write a compound inequality from the graph. Then determine what can be added or subtracted from each term so that it is in the form $-a < x + c < a$. This implies that $|x + c| < a$.

- $-2 < x < 10$
- $-2 - 4 < x - 4 < 10 - 4$
- $-6 < x - 4 < 6$
This implies:

\[ |x - 4| < 6 \]

30. Write a compound inequality from the graph. Then determine what can be added or subtracted from each term so that it is in the form $-a < x + c < a$. This implies that $|x + c| < a$.

- $2 \leq x \leq 8$
- $2 - 5 \leq x - 5 \leq 8 - 5$
- $-3 \leq x - 5 \leq 3$
This implies:

\[ |x - 5| \leq 3 \]
1-6 Solving Compound and Absolute Value Inequalities

Solve each inequality. Graph the solution set on a number line.
34. \( m - 7 > -12 \) or \( -3m + 2 > 38 \)

**SOLUTION:**

\[
\begin{align*}
-3m + 2 & > 38 \\
m - 7 & > -12 \quad \text{or} \quad -3m + 2 - 2 & > 38 - 2 \\
m - 7 + 7 & > -12 + 7 \\
-3m & > 36 \\
m & > -5 \\
m & < -12
\end{align*}
\]

The solution set is \( \{ m | m > -5 \ \text{or} \ m < -12 \} \).

To graph, draw an open circle at \(-12\) and an arrow extending to the left and an open circle at \(-5\) and an arrow extending to the right.

36. \( -|5k| > 15 \)

**SOLUTION:**

The absolute value of a number is always non-negative.
So, no value of \( k \) satisfies the inequality.

The solution set is \( \emptyset \).

Since there is no solution, leave the graph blank.

38. \( 6|4p + 2| - 8 < 34 \)

**SOLUTION:**

\[
\begin{align*}
6|4p + 2| - 8 & < 34 \\
6|4p + 2| & < 42 \\
|4p + 2| & < 7 \\
-7 & < 4p + 2 < 7 \\
-9 & < 4p < 5 \\
-\frac{9}{4} & < p < \frac{5}{4}
\end{align*}
\]

The solution set is:

\[
\left\{ p \left| -\frac{9}{4} < p < \frac{5}{4} \right. \right\}
\]

To graph, draw an open circle at \(-\frac{9}{4}\) and an open circle at \(\frac{5}{4}\) and draw a line to connect the circles.
40. \( \frac{|2w + 8|}{5} \geq 3 \)

**SOLUTION:**

\[
\frac{|2w + 8|}{5} \geq 3 \\
|2w + 8| \geq 15 \\
2w + 8 \leq -15 \text{ or } 2w + 8 \geq 15 \\
2w \leq -23 \quad 2w \geq 7 \\
w \leq -\frac{23}{2} \quad w \geq \frac{7}{2}
\]

The solution set is:

\[
\left\{ w \mid w \leq \frac{-23}{2} \text{ or } w \geq \frac{7}{2} \right\}
\]

To graph, draw a solid circle at \(-\frac{23}{2}\) and an arrow extending to the left and a solid circle at \(\frac{7}{2}\) and an arrow extending to the right.

---

42. numbers that are no more than \(\frac{3}{8}\) unit from 1

**SOLUTION:**

Let \(x\) represent the numbers that are no more than \(\frac{3}{8}\) unit from 1.

So:

\[
1 - \frac{3}{8} \leq x \leq 1 + \frac{3}{8} \\
-\frac{3}{8} \leq x - 1 \leq \frac{3}{8} \\
|x - 1| \leq \frac{3}{8}
\]
1-6 Solving Compound and Absolute Value Inequalities

Solve each inequality. Graph the solution set on a number line.

46. \( y + 7 < 2y + 2 < 0 \)

**SOLUTION:**

\[
\begin{align*}
    y + 7 < 2y + 2 &< 0 \\
    y + 7 < 2y + 2 &< 2y + 2 - 2 \\
    7 < y + 2 &< 2y - 2 \\
    5 < y &< -1
\end{align*}
\]

This implies: \( y > 5 \) and \( y < -1 \)

No value of \( y \) satisfies the compound inequality.

So the solution set is \( \varnothing \).

Since there is no solution leave the graph blank.

48. \( a - 16 \leq 2(a - 4) < a + 2 \)

**SOLUTION:**

\[
\begin{align*}
    a - 16 &\leq 2(a - 4) < a + 2 \\
    a - 16 &\leq 2a - 8 < a + 2 \\
    -16 &\leq a < 8 \\
    -8 &\leq a < 10
\end{align*}
\]

The solution set is \( \{a | -8 \leq a < 10\} \).

To graph, draw a solid circle at \(-8\) and an open circle at \(10\) and draw a line to connect the circles.
53. **ERROR ANALYSIS** David and Sarah are solving \(4|−5x−3|−6 \geq 34\). Is either of them correct? Explain your reasoning.

**SOLUTION:**
Sample answer: David is correct; when Sarah converted the absolute value into two inequalities, she mistakenly switched the inequality symbols.