Before Class:

☐ Read the objective on page 281.

☐ Read the Helpful Hint boxes on pages 281 and 282.

☐ Complete the exercises:

1. To solve an equation with an absolute value expression, what must be done first before applying the absolute value rule?

2. Can the absolute value of an expression ever be negative?

3. When are two absolute value expressions equal?

During Class:

☐ Write your class notes. Neatly write down all examples shown as well as key terms or phrases with definitions. If not applicable or if you were absent, watch the Lecture Series (DVD) for this section and do the same (write down the examples shown as well as key terms or phrases). Insert more paper as needed.

<table>
<thead>
<tr>
<th>Class Notes/Examples</th>
<th>Your Notes</th>
</tr>
</thead>
</table>

Answers: 1) Make sure that the absolute value expression is isolated. 2) no 3) when the expressions inside the absolute value bars are equal to or opposites of each other
Section 4.3 Absolute Value Equations

Practice:

☐ Complete the Vocabulary and Readiness Check on page 284.

☐ Next, complete any incomplete exercises below. Check and correct your work using the answers and references at the end of this section.

Review this example:

1. Solve: \( |p| = 2 \)

Since 2 is positive, \( p = 2 \) or \( p = -2 \).

The solutions are \( 2 \) and \( -2 \).

Your turn:

2. Solve: \( |x| = 7 \)

Review this example:

3. Solve: \( \left| \frac{x}{2} - 1 \right| = 11 \)

\[
\frac{x}{2} - 1 = 11 \quad \text{or} \quad \frac{x}{2} - 1 = -11
\]

\[
2 \left( \frac{x}{2} - 1 \right) = 2(11) \quad \text{or} \quad 2 \left( \frac{x}{2} - 1 \right) = 2(-11)
\]

\[
x - 2 = 22 \quad \text{or} \quad x - 2 = -22
\]

\[
x = 24 \quad \text{or} \quad x = -20
\]

The solutions are \( 24 \) and \( -20 \).

Your turn:

4. Solve: \( \left| \frac{x}{2} - 3 \right| = 1 \)

Review this example:

5. Solve: \( \left| \frac{3x + 1}{2} \right| = -2 \)

The absolute value of any expression is never negative, so no solution exists.

This equation has \( \text{no solution} \).

Your turn:

6. Solve: \( |z| = -2 \)
Section 4.3 Absolute Value Equations

**Review this example:**
7. Solve: $$|2x| + 5 = 7$$

\[
|2x| + 5 = 7 \\
|2x| = 2
\]

\[
x = 2 \text{ or } x = -2
\]

\[
x = 1 \text{ or } x = -1
\]

The solutions are 1 and -1.

**Your turn:**
8. Solve: $$|x - 3| + 3 = 7$$

\[
|x - 3| + 3 = 7 \\
|x - 3| = 4
\]

\[
x - 3 = 4 \text{ or } x - 3 = -4
\]

\[
x = 7 \text{ or } x = -1
\]

The solutions are 7 and -1.

**Review this example:**
9. Solve: $$|3x + 2| = |5x - 8|$$

\[
3x + 2 = 5x - 8 \text{ or } 3x + 2 = -(5x - 8)
\]

\[
3x + 2 = 5x - 8 \text{ or } 3x + 2 = -5x + 8
\]

\[
-2 + 2 = -8 \text{ or } 8x + 2 = 8
\]

\[
-2x = -10 \text{ or } 8x = 6
\]

\[
x = 5 \text{ or } x = \frac{3}{4}
\]

The solutions are $$\frac{3}{4}$$ and 5.

**Your turn:**
10. Solve: $$|2y - 3| = |9 - 4y|$$

\[
2y - 3 = 9 - 4y \text{ or } 2y - 3 = -(9 - 4y)
\]

\[
2y - 3 = 9 - 4y \text{ or } 2y - 3 = -9 + 4y
\]

\[
6y = 12 \text{ or } -2y = -6
\]

\[
y = 2 \text{ or } y = 3
\]

The solutions are 2 and 3.

<table>
<thead>
<tr>
<th>Answer</th>
<th>Text Ref</th>
<th>Video Ref</th>
<th>Answer</th>
<th>Text Ref</th>
<th>Video Ref</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2, -2</td>
<td>Ex 1, p. 281</td>
<td>6</td>
<td>no solution</td>
<td>Sec 4.3, Ex 31</td>
</tr>
<tr>
<td>2</td>
<td>7, -7</td>
<td>Sec 4.3, Ex 1</td>
<td>7</td>
<td>1, -1</td>
<td>Ex 4, p. 283</td>
</tr>
<tr>
<td>3</td>
<td>24, -20</td>
<td>Ex 3, p. 282</td>
<td>8</td>
<td>7, -1</td>
<td>Sec 4.3, Ex 39</td>
</tr>
<tr>
<td>4</td>
<td>8, 4</td>
<td>Sec 4.3, Ex 7</td>
<td>9</td>
<td>(\frac{3}{4}, 5)</td>
<td>Ex 8, p. 284</td>
</tr>
<tr>
<td>5</td>
<td>no solution</td>
<td>Ex 7, p. 283</td>
<td>10</td>
<td>2, 3</td>
<td>Sec 4.3, Ex 65</td>
</tr>
</tbody>
</table>

☐ **Next, insert your homework.** Make sure you attempt all exercises asked of you and show all work, as in the exercises above. Check your answers if possible. Clearly mark any exercises you were unable to correctly complete so that you may ask questions later. **DO NOT ERASE YOUR INCORRECT WORK. THIS IS HOW WE UNDERSTAND AND EXPLAIN TO YOU YOUR ERRORS.**