Algebra II **Section 2.8**
Auch **Date:**

Objectives

- To solve compound inequalities.
- Write and solve absolute value equations and inequalities.

Vocabulary

Disjunction –

Conjunction –

Absolute value –

Example 1
Solve the compound inequality and graph the solution set.

a) $x + 3 \leq 2$ or $3x > 9$

b) $-2x < 8$ and $x - 3 \leq 2$

c) $x + 3 > 7$ or $3x \geq 18$

Try it!

a) $x - 2 < 1$ or $5x \geq 30$

b) $2x \geq -6$ and $-x > -4$

c) $x - 5 < 12$ or $6x \leq 12$

d) $-3x < -12$ and $x + 4 \leq 12$

Absolute Value

Words	**Numbers**	**Algebra**
The absolute value of a real number x, $\lvert x \rvert$, is equal to its distance from zero on a number line	$\lvert 5 \rvert = 5$ $\lvert -5 \rvert = 5$	$\lvert x \rvert = \begin{cases} x \quad if \quad x > 0 \\ -x \quad if \; x < 0 \end{cases}$

Example 2

Solve Absolute-Value Equations

a) $\lvert x - 7 \rvert = 5$

b) $\lvert 3x \rvert + 5 = 14$

Try it!

Solve Absolute-Value Equations

a) $\lvert x + 9 \rvert = 13$

b) $\lvert 6x \rvert - 8 = 22$

Solving an Absolute-value Inequality
1. Isolate the absolute-value expression, if necessary.
2. Rewrite the absolute-value expression as a compound inequality.
3. Solve each part of the compound inequality for x.

Example 3
Solving Absolute-Value Inequalities with Disjunctions

a) $|2x+1|>5$

b) $|4x|+16>8$

Try it!
Solving Absolute-Value Inequalities with Disjunctions

a) $|4x-8|>12$

b) $|3x|+36>12$

Example 4
Solving Absolute-Value Inequalities with Conjunctions

a) $\dfrac{|3x-9|}{2} \le 12$

b) $-|x+3| \ge 8$

Try it!
Solving Absolute-Value Inequalities with Disjunctions

a) $\dfrac{|x-5|}{2} \le 4$

b) $-2|x+5| > 10$