Lesson 3.7 Warm Up

1. Solve and graph: $-18 < 3x - 4 < -4$

2. Solve and graph: $3x > 18$ or $-2x + 4 > 8$

3. Given A = {a, b, c} and B = {a, b, c, d},

   a. is $A \subseteq B$? b. is $B \subseteq A$

Ex. Solve: $|x| + 2 = 12$

Ex. Solve: $5|x| - 1 = 8$

Ex. Solve: $|x - 5| + 6 = 17$

Ex. Solve: $5|x - 2| + 8 = 23$

Lesson 3.7 Absolute Value Equations & Inequalities

Essential Understanding: You can solve absolute value equations and inequalities by first isolating the absolute value expression, if necessary. then write an equivalent pair of linear equations or inequalities.

Ex. Solve: $|x| = 6$

Ex. Solve: $2|x| - 4 = 8$

Ex. Solve: $|x - 2| = 9$

1 Solve: $|x| = 9$

2 Solve: $|x| + 3 = 7$

3 Solve: $4|x - 5| = 20$

4 Solve: $|3x - 6| - 5 = -7$

Absolute value means the distance from zero and distance is NEVER negative. Thus, when you get the absolute value bars equal to a negative number, your answer will be no solution.

Ex. Solve: $3|2x + 9| + 12 = 10$

Ex. Starting from 100 ft away, your friend skates toward you and then passes by you. She skates a constant speed of 20 ft/s. Her distance d from you in feet after t seconds is given by $d = |100 - 20t|$. At what time is she 40 ft from you?

Lesson 3.7 Day 2 Warm Up

1. Solve: $|9x + 7| = 16$

2. Write in roster form the set of natural numbers less than 8.

3. Solve and write in set-builder notation: $-5x + 2 > -8$

Lesson 3.7 Day 2

Solving Absolute Value Inequalities:

To solve an inequality in the form $|A| < b$, where A is a variable expression and $b > 0$, solve the compound inequality $-b < A < b$. (It is an 'and' compound inequality).

To solve an inequality in the form $|A| > b$, where A is a variable expression and $b > 0$, solve the compound inequality $A < -b$ or $A > b$. (It is an 'or' compound inequality).

Ex. Solve and graph: $|8x - 1| \leq 15$

Ex. Solve and graph: $5|x| + 9 > 36$

6 Solve: $|x - 3| < 5$

Before setting up the compound inequality, your first step still needs to be to get the absolute value bars by themselves.

Ex. Solve and graph: $|8a| \geq 24$.

Ex. Solve and graph: $|x - 1| < 8$

5 Solve: $|x + 4| > 5$

Ex. A company makes boxes of crackers that should weigh 213 g. A quality-control inspector randomly selects boxes to weigh. Any box that varies from the weight by more than 5 g is sent back. What is the range of allowable weights for a box of crackers?