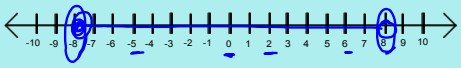
Section 1-6 (cont.)
Absolute Value Inequalities

Students will be able to write and solve inequalities involving absolute value.

Absolute value inequalities:

< is less than, so we will set up two inequalities and look for the **and** solution

$|x| < 8$



> is greater than, so we use **or**

$|x| > 4$

Solve and graph:

$|3x - 4| \leq 8$

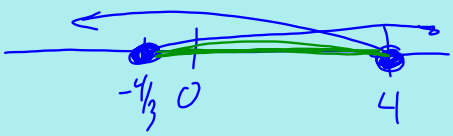
Is this an 'and' or an 'or' inequality?

$3x - 4 \leq 8$ and $3x - 4 \geq -8$

$+4 \quad +4 \qquad +4 \quad +4$

$\frac{3x}{3} \leq \frac{12}{3} \qquad \frac{3x}{3} \geq \frac{-4}{3}$

$x \leq 4 \qquad x \geq -4/3$



$-4/3 \leq x \leq 4$

Solve and graph:

$|5x + 10| \geq 15$

$5x + 10 \geq 15$ or $5x + 10 \leq -15$

$-10 \quad -10 \qquad -10 \quad -10$

$\frac{5x}{5} \geq \frac{5}{5} \qquad \frac{5x}{5} \leq \frac{-25}{5}$

$x \geq 1$ or $x \leq -5$

#25. $3|y - 9| < 27$

$|y-9| < 9$

$y-9 < 9$ and $y-9 > -9$

$+9 \quad +9 \qquad +9 \quad +9$

$y < 18 \qquad y > 0$

$0 < x < 18$

A manufactured item's actual measurement and its target measurement can differ by a certain amount, called a tolerance. Tolerance is 1/2 the distance of the max and min acceptable values.

Example: The diameter of a ball-bearing in a wheel assembly must be between 1.758 cm and 1.764 cm. Write the absolute value and compound inequality.

$1.758 \leq x \leq 1.764$

$|x - 1.761| \leq .003$

1.761, 1.758, 1.764

$|x - \text{target \#}| \leq \text{tolerance}$

#71. Write the absolute value inequality to represent the following situation.

A friend is planning a trip to Alaska. He buys a coat recommended for temps from -15 degrees F to 45 degrees F.

-15, 15, 45

$|x - 15| \leq 30$

Hwk: pg. 46-48

#32-40 evens, 53,
56 - 64 (every 4th),
70-74 evens

Section 1-6.notebook