2.1 Absolute Value:
OBJ: To solve and graph absolute value equations and inequalities

**Need to solve 2 equations**

\[ |x + 2| = 3 \]
\[ |x + 2| = -3 \]

Rewrite without the absolute value:

\[ x + 2 = 3 \]
\[ x + 2 = -3 \]
\[ x = 1 \]
\[ x = -5 \]

Solve the absolute value equation:

Step #1: Get absolute value by itself
Step #2: rewrite without absolute value
Step #3: solve for x
Step #4: graph/check
Solve the absolute value equation and graph solution on a number line:

\[|t + 7| = 1 \quad |x - 2| = 5\]

\[\frac{|x + 2| - 2}{x + 1} = \frac{9}{12} \quad \frac{3|x + 1|}{x} = \frac{12}{4}\]

\[|x + 2| = 11\]
\[x = 9\]
\[x = -13\]

\[|x + 1| = 4\]
\[x = 3\]
\[x = -5\]

Growth (Or): the distance from \(x\) to 0 is \(\textit{more}\) than \(a\) units.

\[|x| \geq a\]

Less Than (And): the distance from \(x\) to 0 is \(\textit{less}\) than \(b\) units.

\[|x| \leq b\]

Solve the inequality. Graph the solution.

\[\frac{|x + 1|}{x} > 24\]
\[8x < -24\]
\[x < -3\]

\[\frac{|x + 1|}{x} < -24\]
\[8x > -24\]
\[x > 3\]

\[|x - 2| \leq 1\]

\[x \leq 3\]
\[x \geq 1\]
A box of cereal should have a mass of 400 g. The quality control inspector measures the mass of every eighth box. The inspector rejects any box that is not within 10 g of the ideal mass. Find the range of acceptable masses. Write and solve an absolute-value inequality for this situation.

Example: 3 Word problem

A catering business specializes in catering wedding receptions. They charge $500 for setting up the buffet and an additional $60.00 per guest. Mr. and Mrs. Smith want to spend no more than $1500 on the catering. Write and solve an inequality to determine the number of guests that can be invited to the reception.

Draw a line to match the graph to the equation or inequality.

\[ |x| = 3 \]
\[ |x| < 3 \]
\[ |x| \geq 3 \]

Explain why a compound inequality can have no solutions or infinitely many solutions.
Assignment:
P 103
# 7, 8, 14, 16, 19
P 104
# 24, 26, 29, 33
P 105
#2, 3