Warm Up:
Write an inequality:
The dining hall holds at most 450 people.
\[ d \leq 450 \]

Solve each inequality.
\[-4m \geq 22 \]
\[ m \leq \frac{22}{-4} \]
\[ m \leq -5.5 \]

ACT Question:
There are 53 people signed up for a race on an upcoming Saturday, and there are 21 people signed up for a race on an upcoming Sunday. If 12 people signed up for both races, how many people are signed up for only one race?
A.) 9  B.) 41  C.) 50  D.) 62  E.) 74

\[ 53 - 12 = 41 \]
\[ 21 - 12 = 9 \]

Vocabulary:
**Compound Inequality:** consists of two distinct inequalities joined by the word and or the word or.

Examples 1 and 2:
Write a compound inequality that represents each phrase and graph.

All numbers that are less than -3 or greater than or equal to 5.
[\(-3 < x \leq 5\)] [\(x \geq 5\)]

The time a cake must bake is between 25 minutes and 30 minutes, inclusive.
[\(25 \leq x \leq 30\)]
Examples 3 and 4:
Solve each compound inequality and graph your solutions.

\[
\begin{align*}
5 < k - 2 < 11 & \\
5 + 2 < k < 13 & \\
7 < k & \\
\end{align*}
\]

\[
\begin{align*}
3 > 11 + k & \\
3 + 11 > k & \\
14 > k & \\
\end{align*}
\]

\[
\begin{align*}
k > 7 & \\
k < 14 & \\
\end{align*}
\]

Examples 5 and 6:
Solve each compound inequality and graph your solutions.

\[
\begin{align*}
3d + 3 \leq -1 & \text{ or } 5d + 2 \geq 12 \\
\end{align*}
\]

\[
\begin{align*}
d \geq 2 & \\
\end{align*}
\]

\[
\begin{align*}
9 - c < 2 & \text{ or } -3c > 15 \\
9 - 2 < c & \text{ or } -3c > 15 \\
7 < c & \text{ or } c < -5 \\
\end{align*}
\]

Examples 7-9:
(with your shoulder buddy)
Write a compound inequality that represents each phrase and graph.

All real numbers that are between -2 and 4

\[
\begin{align*}
-2 < x < 4 & \\
\end{align*}
\]

Solve each compound inequality and graph your solutions.

\[
\begin{align*}
-4 > y + 2 & > -10 \\
-4 - 2 > y & > -12 \\
-6 > y & > -12 \\
\end{align*}
\]

\[
\begin{align*}
5 - m & < 4 \text{ or } 35 - 7m & < -14 \\
5 - m & < 4 \text{ or } 35 - 7m & < -14 \\
\end{align*}
\]

\[
\begin{align*}
m > 1 & \text{ or } m < 5 \\
m < 5 & \text{ or } m > 1 \\
\end{align*}
\]

Examples 10 and 11:
Write a compound inequality that each graph could represent.

\[
\begin{align*}
X \geq 2 & \text{ or } X < -4 \\
\end{align*}
\]

\[
\begin{align*}
3 \leq x & \leq 2 \\
\end{align*}
\]
Examples 12 and 13:
Solve each compound inequality.
\[
\frac{y - 2}{2} \leq 3 \text{ or } \frac{1 + 2y}{3} \geq 41
\]
\[
3 > -0.25v > -2.5
\]

Example 14:
The absorbency of a certain towel is considered normal if the towel is able to hold between six and eight mL. The first checks for materials result in absorbency measures of 6.2 mL and 7.2 mL. What possible values for the third reading \( m \) will make the average absorbency normal?
\[
3 \leq \frac{6.2 + 7.2 + m}{3} \leq 8
\]
\[
18 \leq 13.4 + m \leq 24
\]
\[
-13.4 \leq -13.4 \leq -13.4
\]
\[
4.6 \leq m \leq 10.6
\]

Summary
In one sentence....
Describe the graph of "and" compound inequalities and "or" compound inequalities.

Coursework
pg 204 # 10, 11-21 odd, 35, 37, 39, 41, 42