Today we will:
• Solve linear inequalities using addition and subtraction, multiplication and division.
• Graph these inequalities.

### SOLVING FOR INEQUALITIES

**Watch Out!**

Solve each inequality. Check your solution, and then graph it on a number line.

1. \( t + 12 \geq 8 \)
2. \( n + 12 > -12 \)
3. \( 16 \leq h + 9 \)

-6 -5 -4 -3 -2 -1 0 1 2

4. \( y + 4 > -2 \)
5. \( 3r + 6 > 4r \)
6. \( \frac{3}{2}q - 5 \geq \frac{1}{2}q \)

-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9

Solve each inequality. Check your solution.

7. \( \frac{3m}{5} < -\frac{3}{20} \)
8. \( -2.51 \leq -\frac{2h}{4} \)
9. \( 9k + 12 > 8k \)

-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8

10. \( -\frac{3}{4} > -\frac{9p}{5} \)
11. \( 4y < 5y + 14 \)
12. \( 3n + 17 < 4n \)
NAME:

Today we will:
• Solve linear inequalities using addition and subtraction.
• Graph these inequalities.

Addition/Subtraction Property of Inequalities

Watch Out!

Solve each inequality. Check your solution, and then graph it on a number line.

1. \( t + 12 \geq 8 \)

2. \( n + 12 > -12 \)

3. \( 16 \leq h + 9 \)

4. \( y + 4 > -2 \)

5. \( 3r + 6 > 4r \)

6. \( \frac{3}{2}q - 5 \geq \frac{1}{2}q \)

Solve each inequality. Check your solution.

7. \( 4p \geq 3p + 0.7 \)

8. \( r + \frac{1}{4} > \frac{3}{8} \)

9. \( 9k + 12 > 8k \)

10. \( -1.2 > 2.4 + y \)

11. \( 4y < 5y + 14 \)

12. \( 3n + 17 < 4n \)
Today we will:
- Solve linear inequalities using multiplication and division
- Graph these inequalities.

**Multiplication/Division Property of Inequalities**

**Watch Out!**

Solve each inequality. Check your solution.

1. \( \frac{y}{6} \leq 2 \)
2. \( -\frac{n}{50} > 22 \)
3. \( \frac{3}{5}h \geq -3 \)
4. \( -\frac{p}{6} < -6 \)
5. \( \frac{1}{4}n \geq 10 \)
6. \( -\frac{2}{3}b < \frac{1}{3} \)
7. \( \frac{3m}{5} < -\frac{3}{20} \)
8. \( -2.51 \leq -\frac{2h}{4} \)
9. \( \frac{g}{5} \geq -2 \)
10. \( -\frac{3}{4} > -\frac{9p}{5} \)
11. \( \frac{n}{10} \geq 5.4 \)
12. \( \frac{2a}{7} \geq -6 \)
Today we will:
• Solve multi-step inequalities
• Graph these inequalities.

Solve each inequality. Check your solution.

1. $11y + 13 \geq -1$
2. $8n - 10 < 6 - 2n$
3. $\frac{q}{7} + 1 > -5$

4. $6n + 12 < 8 + 8n$
5. $-12 - d > -12 + 4d$
6. $5r - 6 > 8r - 18$
Graph and Solve Compound Inequalities with and

Graph and Solve Compound Inequalities with or

5.4 Solving Compound Inequalities
Today we will:
• Solve and graph absolute value inequalities.

### Solving Absolute Value Equations

### Absolute Value Inequalities

- **less-than AND**
- **great-OR**

<table>
<thead>
<tr>
<th>What is an absolute value?</th>
<th>Evaluate an Absolute Value Expression</th>
<th>Evaluate an Absolute Value Expression</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Solve an Absolute Value Inequality (&lt;)</th>
<th>Solve an Absolute Value Inequality (&gt;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td>Example</td>
</tr>
</tbody>
</table>

Graph
Today we will:

- Solve and graph linear inequalities with two variables.

### Graphing Linear Inequalities

<table>
<thead>
<tr>
<th>Step 1:</th>
<th>Re-write your equation in slope-intercept form.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Step 2:</th>
<th>Graph the y-intercept and use the slope to graph one more point.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Step 3:</th>
<th>Figure out if you need to make a dotted line or solid line to satisfy the inequality.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Step 4:</th>
<th>Test a point to figure out where to shade.</th>
</tr>
</thead>
</table>

| How do you know if the line needs to be dotted? |
| How do you know if the line needs to be solid? |

Describe this step. Then, shade the graph that you started above.
NAME:
Today we will:
• Solve and graph linear inequalities with two variables using a TI-84.

### Graphing Linear Inequalities

#### Graph the Inequality $y \leq 3x + 1$

**Slope-Intercept Form**

<table>
<thead>
<tr>
<th>STEPS</th>
<th>PICTURE</th>
</tr>
</thead>
</table>
| **STEP 1:** $Y1 = 3x + 1$  
  - Arrow to the far left side of $Y1$  
  - ENTER until the “shade below” symbol is displayed | ![Graph of $Y1$] |
| **STEP 2:** Adjust your WINDOW  
  - Set your graph to the standard window setting  
  - ZOOM – Choose 6:2Standard | ![Window Settings] |
| **STEP 3:** GRAPH  
  - The graph will shade the area that makes the inequality TRUE  
  - Move the cursor to identify coordinates  
  - NOTE: You will have to determine whether to draw a solid line or a dotted line for the inequality, as the calculator will always display a solid line by default. | ![Graph of $Y1$ shaded] |

#### Graph the System $y > -2x + 4$ and $y \leq x - 2$

<table>
<thead>
<tr>
<th>STEPS</th>
<th>PICTURE</th>
</tr>
</thead>
</table>
| **STEP 1:** $Y1 = -2x + 4$ and $Y2 = x - 2$  
  - Change $Y1$ to display the shade above symbol  
  - Change $Y2$ to display the shade below symbol | ![Graph of $Y1$ and $Y2$] |
| **STEP 3:** GRAPH  
  - The double shaded region on the graph makes the system TRUE  
  - Move the cursor to identify coordinates | ![Double Shaded Region] |