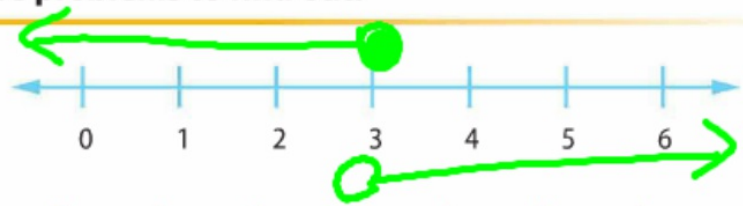
7 8 9 10 11 12 13 14 15 16 17

Got It? Do these problems to find out.

a. $n + 2 \leq 5$

$-2 \quad -2$

$n \leq 3$



b. $y - 3 > 9$

$+3 \quad +3$

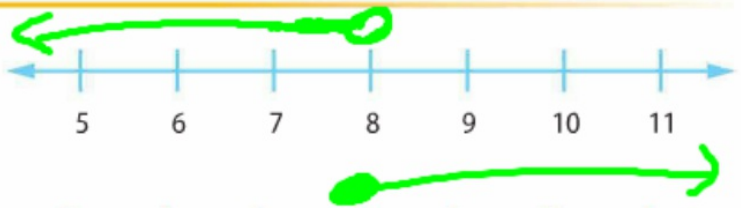
$y > 12$

Got It? Do these problems to find out.

c. $10x < 80$

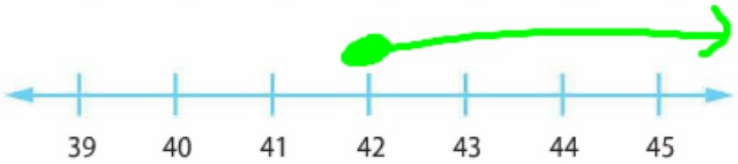
$\frac{10}{10} \quad \frac{80}{10}$

$x < 8$



d. $\frac{x}{6} \geq 7 \cdot 6$

$x \geq 42$



Guided Practice

Solve each inequality. Graph the solution on a number line. (Examples 1–4)

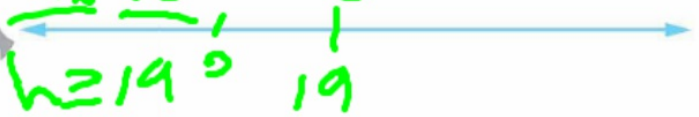
1. $h - 6 \geq 13$

Show your work.

$h \geq 19$

$+6 \quad +6$

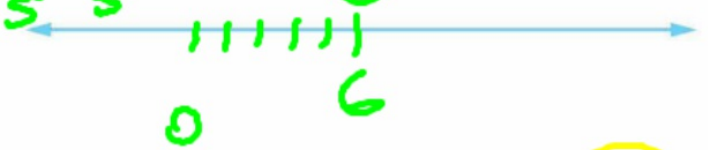
$h \geq 19$



2. $5y > 30$

$y > 6$

$\frac{5y}{5} > \frac{30}{5}$



$2x \leq 10$

$x \leq 5$

3. Johanna's parents give her $10 per week for lunch money. She cannot decide whether she wants to buy or pack her lunch. If a hot lunch at school costs $2, write and solve an inequality to find the maximum number of times per week Johanna can buy her lunch. (Example 5)

4. Tino's Pizza charges $9 for a cheese pizza. Eileen has $45 to buy pizza for the Spanish Club. Write and solve an inequality to find the maximum number of pizzas that Eileen can buy. (Example 5) **$9p \leq 45$; $p \leq 5$; Eileen can buy a maximum of 5 pizzas.**

5. **Building on the Essential Question** How is solving an inequality similar to solving an equation?

Sample answer: You can use addition, subtraction, multiplication, and division properties to solve both.

Independent Practice

Go online for Step-by-Step Solutions eHelp

Solve each inequality. Graph the solution on a number line. (Examples 1–4)

1. $2 + y \leq 3$ **$y \leq 1$**

Show your work.

2. $w - 1 < 4$ **$w < 5$**

3 $7x > 56$ **$x > 8$**

4. $\frac{d}{3} \leq 2$ **$d \leq 6$**

5 A company charges \$0.10 for each letter engraved. Bobby plans to spend no more than \$5.00 on the engraving on a jewelry box. Write and solve an inequality to find the maximum number of letters he can have engraved. (Example 5)

$0.1x \leq 5.00$; $x \leq 50$; The maximum is 50 letters.

6. CCSS **Model with Mathematics** Refer to the graphic novel frame below for Exercises a–b.

a. Suppose David has $65 to spend on his ticket and some shirts. He already spent $32.25 on his ticket and fee. Write an inequality that could be used to find the maximum number of shirts he can buy.

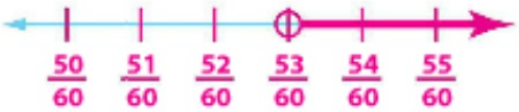
$14.50x \leq 32.75$

b. What is the maximum number of shirts he can buy?

2 shirts

Solve each inequality. Graph the solution on a number line.

7 $p - \frac{7}{12} > \frac{3}{10}$ $p > \frac{53}{60}$



8. $f + 0.3 < 1.7$ $f < 1.4$

H.O.T. Problems Higher Order Thinking

9. **Model with Mathematics** Write a word problem that would have the solution $p \leq 21$.

Sample answer: An airplane can hold 53 passengers and there are currently 32 passengers on board. How many more passengers can board the airplane?

10. **Persevere with Problems** In three math tests, you have scored 91, 95, and 88 points. You are about to take your next test. Suppose you want to have an average score of at least 90 points after all four tests. Explain a method you could use to find the score you must receive in order to average at least 90 points. Then find the least score.

Sample answer: The sum of all of the scores divided by 4 must be at least 90 and the words at *least* mean greater than or equal to. If I solve the inequality $\frac{91 + 95 + 88 + x}{4} \geq 90$, I can find the least score; 86 points

11. **Construct an Argument** Does the order of the quantities in an inequality matter? Explain.

yes; Sample answer: $x > 5$ is not the same relationship as $5 > x$. However, $x > 5$ is the same relationship as $5 < x$.

12. **Model with Mathematics** Write a real-world problem and an inequality that can be represented by the number line below.

$x > -2$; Sample answer: A certain brand of sleeping bag is certified to keep the user warm in temperatures greater than −2°F. At what temperatures will the sleeping bag keep the user warm?