

Study Guide

Solving Two-Step Equations

To solve a two-step equation, undo each operation. First undo addition and subtraction. Then undo multiplication and division.

Examples 1 Solve $4k - 3 = 13$. Check your solution.

$$4k - 3 + 3 = 13 + 3$$

Add 3 to each side to undo subtraction of 3.

$$4k = 16$$

$$\frac{4k}{4} = \frac{16}{4}$$

Divide each side by 4 to undo multiplication of 4.

$$k = 4$$

Check: $4k - 3 = 13$

$$4 \cdot 4 - 3 \stackrel{?}{=} 13$$

Replace k with 4.

$$16 - 3 \stackrel{?}{=} 13$$

Multiply first. Then subtract.

$$13 = 13 \quad \checkmark$$

2 Solve $\frac{r}{5} + 2 = 6$. Check your solution.

$$\frac{r}{5} + 2 - 2 = 6 - 2$$

Subtract 2 from each side to undo addition of 2.

$$\frac{r}{5} = 4$$

$$\frac{r}{5} \times 5 = 4 \times 5$$

Multiply each side by 5 to undo division by 5.

$$r = 20$$

Check: $\frac{r}{5} + 2 = 6$

$$\frac{20}{5} + 2 \stackrel{?}{=} 6$$

Replace r with 20.

$$4 + 2 \stackrel{?}{=} 6$$

Divide first. Then add.

$$6 = 6 \quad \checkmark$$

Solve each equation. Check your solution.

1. $6t - 3 = 21$

2. $2m + 7 = 15$

3. $8 - 1.2y = 2$

4. $\frac{h}{3} - 5 = 2$

5. $\frac{v}{2} + 11 = 16$

6. $\frac{x}{7} + 1 = 4$

7. $9w - 7 = 74$

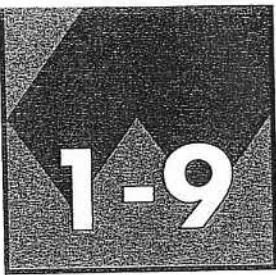
8. $50 - 3b = 35$

9. $\frac{n}{10} - 2.5 = 7.5$

10. $\frac{a}{7} - 13 = 12$

11. $6x - 12 = 78$

12. $7p + 8.4 = 8.4$



Study Guide

Solving Inequalities

The symbol $>$ means **greater than**. The symbol $<$ means **less than**.
Inequalities are sentences that contains $>$ or $<$.

Symbols	Words
$2r + 1 > 5$	$2r + 1$ is greater than 5.
$w - 6 < 9$	$w - 6$ is less than 9.

An inequality has more than one solution.

Example Solve $2r + 1 > 5$. Show the solution on a number line.

$$2r + 1 - 1 > 5 - 1 \quad \text{Undo addition.}$$

$$2r > 4$$

$$\frac{2r}{2} > \frac{4}{2} \quad \text{Undo multiplication.}$$

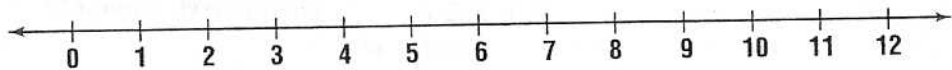
$$r > 2$$

To graph the solution on a number line, draw a circle at 2. Then draw an arrow to show all numbers greater than 2.

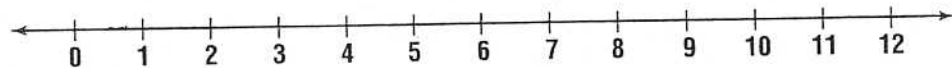


Solve each inequality. Graph the solution on a number line.

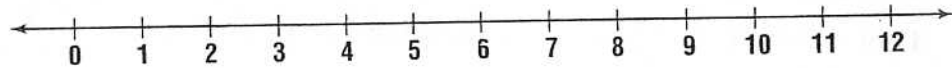
1. $y + 7 < 12$



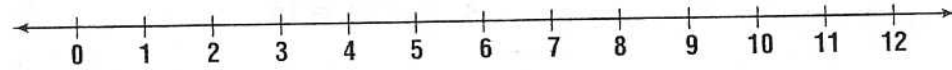
2. $2t - 1 > 9$



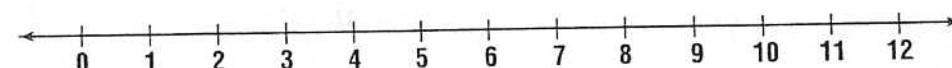
3. $m - 3 < 8$



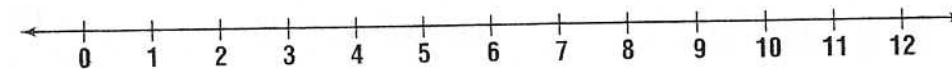
4. $6w > 18$



5. $1 + 2h < 15$



6. $\frac{e}{2} > 3$





Study Guide

Solving Equations

Integer equations are solved like whole-number equations. For addition or subtraction equations, add or subtract the same number on both sides of the equation. Watch for signs. Use the additive inverse to simplify equations.

Examples 1 Solve $k + 16 = -20$.

$$\begin{aligned}k + 16 &= -20 \\k + 16 - 16 &= -20 - 16 \\k &= -36\end{aligned}$$

2 Solve $c - (-21) = 40$.

$$\begin{aligned}c - (-21) &= 40 \\c + 21 &= 40 \\c + 21 - 21 &= 40 - 21 \\c &= 19\end{aligned}$$

For multiplication and division equations, multiply or divide both sides of the equation by the same number.

Examples 3 Solve $-7t = -98$.

$$\begin{aligned}-7t &= -98 \\-7t \div (-7) &= -98 \div (-7) \\t &= 14\end{aligned}$$

4 Solve $\frac{m}{20} = -4$.

$$\begin{aligned}\frac{m}{20} &= -4 \\\frac{m}{20} \cdot 20 &= -4(20) \\m &= -80\end{aligned}$$

For two-step equations, work backwards. Add or subtract first. Then multiply or divide.

Examples 5 Solve $3x - 7 = -19$.

$$\begin{aligned}3x - 7 &= -19 \\3x - 7 + 7 &= -19 + 7 \\3x &= -12 \\x &= -4\end{aligned}$$

6 Solve $\frac{v}{3} - (-2) = 7$.

$$\begin{aligned}\frac{v}{3} - (-2) &= 7 \\\frac{v}{3} + 2 &= 7 \\\frac{v}{3} + 2 - 2 &= 7 - 2 \\\frac{v}{3} &= 5 \\\frac{v}{3} \cdot 3 &= 5(3) \\v &= 15\end{aligned}$$

Solve each equation. Check your solution.

1. $7z = -49$

2. $m \div 9 = -50$

3. $y - (-22) = 50$

4. $17 = k - (-8)$

5. $-60 = -3f$

6. $-70 = \frac{b}{5}$

7. $p - 10 = -33$

8. $-145 = w + 1$

9. $2h + (-2) = 18$

10. $\frac{n}{5} + 5 = 3$

11. $2y - 1 = -7$

12. $-99 = -33 + g$

