3-4 Reteaching

Solving Multi-Step Inequalities

Solving inequalities is similar to solving equations. However, *if you multiply or divide each side of an inequality by a negative number, the direction of the inequality sign is reversed.*

Problem

What are the solutions of $6 - 3k > 45$?

$6 - 3k > 45$	Original inequality
$6 - 3k - 6 > 45 - 6$	Subtract 6 from each side.
$-3k > 39$	Simplify.
$\frac{-3k}{-3} < \frac{39}{-3}$	Divide each side by -3 and reverse the sign.
$k < -13$	Simplify.

Problem

What are the solutions of $6(n - 3) + 4n \leq 42$?

$6(n - 3) + 4n \leq 42$	Original inequality
$6n - 18 + 4n \leq 42$	Distributive Property
$10n - 18 \leq 42$	Combine like terms.
$10n - 18 + 18 \leq 42 + 18$	Add 18 to each side.
$10n \leq 60$	Simplify.
$\frac{10n}{10} \leq \frac{60}{10}$	Divide each side by 10.
$n \leq 6$	Simplify.

Problem

What are the solutions of $7p + 12 > 6p - 15$?

$7p + 12 > 6p - 15$	Original inequality
$7p + 12 - 6p > 6p - 15 - 6p$	Subtract $6p$ from each side.
$p + 12 > -15$	Simplify.
$p + 12 - 12 > -15 - 12$	Subtract 12 from each side.
$p > -27$	Simplify.

3-4 **Reteaching** (continued)

Solving Multi-Step Inequalities

Exercises

Solve each inequality.

1. $8w + 9 < -31$ **$w < -5$**

2. $5h - 6 \geq 24$ **$h \geq 6$**

3. $17 - 2a \leq 29$ **$a \geq -6$**

4. $5 - 3t > -7$ **$t < 4$**

5. $\frac{d}{7} + 4 > -2$ **$d > -42$**

6. $4 - \frac{2x}{3} \leq -8$ **$x \geq 18$**

7. $5(y - 2) - 2y \geq 5$ **$y \geq 5$**

8. $8(2f + 3) + 4f \leq -16$ **$f \leq -2$**

9. $3(p - 2) - 7p < 6$ **$p > -3$**

10. $2(3b + 5) - 10b > 30$ **$b < -5$**

11. $7z - 4 \leq 6z + 18$ **$z \leq 22$**

12. $8m + 7 \geq 6m - 9$ **$m \geq -8$**

13. $12c + 6 > 9c - 15$ **$c > -7$**

14. $7d + 2 < 17 - 3d$ **$d < \frac{3}{2}$**

15. A student had $45 when she went to the mall. She spent $9 on a pair of earrings. Then she wants to buy some CDs that cost $12 each. Write and solve an inequality to determine how many CDs she can buy.

$12c + 9 \leq 45$; at most 3 CDs

16. A friend needs at least $125 to go on the class trip. He has saved $45. He makes $20 for each lawn he mows. Write and solve an inequality to determine how many lawns he needs to mow to go on the trip.

$20m + 45 \geq 125$; at least 4 lawns

17. You have earned 85, 92, 95, and 88 on tests this grading period. You have one last test and want an average of at least 90. Write and solve an inequality to determine what scores you can earn to achieve your goal.

$\frac{85 + 92 + 95 + 88 + s}{5} \geq 90$; at least 90