One-Step Inequalities

Name: _____	Date: _____	Score: _____ / 18

Quick Review and Helpful Hints

Solve a one-step inequality just like an equation, using inverse operations on both sides – with one special rule: if you multiply or divide both sides by a *negative* number, you must *flip* the inequality sign. The answer is a range of values.

▷ **Example:** Solve $x + 4 > 9$. **Work:** Undo the $+4$ by subtracting 4 from both sides: $x + 4 - 4 > 9 - 4$. No negative multiplying or dividing, so the sign stays the same. ★ **Answer:** $x > 5$

$x > 5$: open circle, shade right.

Practice Problems

Solve each inequality.

1. $x + 3 > 7$ _____

2. $x - 2 < 5$ _____

3. $4x \geq 12$ _____

4. $\frac{x}{2} \leq 4$ _____

5. $x + 5 \leq 2$ _____

6. $3x > 9$ _____

7. $x - 6 \geq -1$ _____

8. $-2x < 8$ _____

9. $\frac{x}{3} > 2$ _____

10. $5x \leq -15$ _____

11. $x + 7 < 7$ _____

12. $-x > 3$ _____

13. $2x \geq -8$ _____

14. $x - 4 > -4$ _____

Word Problems

15. A number increased by 5 is at most 12. Write and solve an inequality for the number. _____

16. Twice a number is less than 10. Write and solve an inequality. _____

17. Three less than a number is at least 4. Write and solve an inequality. _____

18. Half of a number is greater than 6. Write and solve an inequality. _____

Answer Keys

1. $x > 4$	**7.** $x \geq 5$	**13.** $x \geq -4$
2. $x < 7$	**8.** $x > -4$	**14.** $x > 0$
3. $x \geq 3$	**9.** $x > 6$	**15.** $x \leq 7$
4. $x \leq 8$	**10.** $x \leq -3$	**16.** $x < 5$
5. $x \leq -3$	**11.** $x < 0$	**17.** $x \geq 7$
6. $x > 3$	**12.** $x < -3$	**18.** $x > 12$

Step-by-Step Explanations

1. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Undo the $+3$ by subtracting 3 from both sides: $x > 7 - 3$, so $x > 4$. There is no negative dividing, so the sign stays. So the final answer is $x > 4$.

2. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Add 2 to both sides: $x < 5 + 2$, so $x < 7$. So the final answer is $x < 7$.

3. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Divide both sides by 4 (a positive number, so the sign stays): $x \geq 12 \div 4 = 3$. So the final answer is $x \geq 3$.

4. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Multiply both sides by 2: $x \leq 4 \times 2 = 8$. So the final answer is $x \leq 8$.

5. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Subtract 5 from both sides: $x \leq 2 - 5 = -3$. So the final answer is $x \leq -3$.

6. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Divide both sides by 3: $x > 9 \div 3 = 3$. So the final answer is $x > 3$.

7. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Add 6 to both sides: $x \geq -1 + 6 = 5$. So the final answer is $x \geq 5$.

8. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Divide both sides by -2. Dividing by a negative *flips* the inequality: $x > 8 \div (-2) = -4$, so $x > -4$. So the final answer is $x > -4$.

9. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Multiply both sides by 3: $x > 2 \times 3 = 6$. So the final answer is $x > 6$.

10. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Divide both sides by 5: $x \leq -15 \div 5 = -3$. So the final answer is $x \leq -3$.

11. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Subtract 7 from both sides: $x < 7 - 7 = 0$. So the final answer is $x < 0$.

12. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Divide both sides by -1 and flip the sign: $x < -3$. So the final answer is $x < -3$.

13. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Divide both sides by 2: $x \geq -8 \div 2 = -4$. So the final answer is $x \geq -4$.

14. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Add 4 to both sides: $x > -4 + 4 = 0$. So the final answer is $x > 0$.

15. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Let x be the number. "Increased by 5 is at most 12" means $x + 5 \leq 12$. Subtract 5: $x \leq 7$. So the final answer is $x \leq 7$.

16. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is "Twice a number is less than 10" means $2x < 10$. Divide by 2: $x < 5$. So the final answer is $x < 5$.

17. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is "Three less than a number is at least 4" means $x - 3 \geq 4$. Add 3: $x \geq 7$. So the final answer is $x \geq 7$.

18. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is "Half a number is greater than 6" means $\frac{x}{2} > 6$. Multiply by 2: $x > 12$. So the final answer is $x > 12$.

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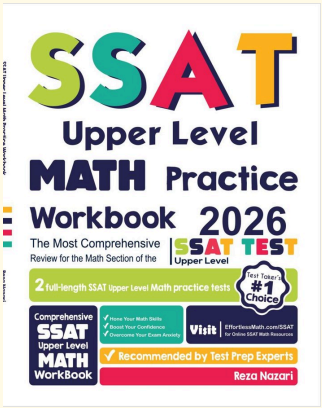

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