Algebra: Solving & Graphing Inequalities

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Name: _____ Date: _____ Score: ____ / 10

DIRECTIONS

Solve each inequality for x. Write the solution in inequality notation and describe the graph (open/closed circle, arrow direction).

1. Solve and graph:

   x + 4 > 9

   Answer: _____

2. Solve and graph:

   x − 3 ≤ 5

   Answer: _____

3. Solve and graph:

   x + 7 ≥ 2

   Answer: _____

4. Solve and graph:

   x − 5 < −1

   Answer: _____

5. Solve and graph:

   3x > 12

   Answer: _____

6. Solve and graph:

   −2x ≤ 8

   Answer: _____

7. Solve and graph:

   x ÷ 4 < 3

   Answer: _____

8. Solve and graph:

   2x + 1 > 7

   Answer: _____

9. Solve and graph:

   3x − 4 ≤ 11

   Answer: _____

10. Solve and graph:

    −4x + 3 > −9

    Answer: _____

Based on the Numberbender lesson "ALGEBRA Solving and Graphing Inequalities" • youtu.be/50qUULhZf-c

Answer Key & Solutions

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TEACHER NOTES

Items 1–4: one-step inequalities (add/subtract). Items 5–7: one-step with multiplication/division — flip the sign when dividing by a negative. Items 8–10: two-step inequalities.

1. Solve and graph: $x + 4 > 9$

Answer: $x > 5$

Subtract 4: $x > 9-4 = 5$. Open circle at 5, arrow right.

2. Solve and graph: $x - 3 \leq 5$

Answer: $x \leq 8$

Add 3: $x \leq 5+3 = 8$. Closed circle at 8, arrow left.

3. Solve and graph: $x + 7 \geq 2$

Answer: $x \geq -5$

Subtract 7: $x \geq 2-7 = -5$. Closed circle at -5, arrow right.

4. Solve and graph: $x - 5 < -1$

Answer: $x < 4$

Add 5: $x < -1+5 = 4$. Open circle at 4, arrow left.

5. Solve and graph: $3x > 12$

Answer: $x > 4$

Divide by 3: $x > 12 \div 3 = 4$. Open circle at 4, arrow right.

6. Solve and graph: $-2x \leq 8$

Answer: $x \geq -4$

Divide by -2 — flip sign: $x \geq 8 \div (-2) \rightarrow x \geq -4$.

7. Solve and graph: $x \div 4 < 3$

Answer: $x < 12$

Multiply by 4: $x < 3 \times 4 = 12$. Open circle at 12, arrow left.

8. Solve and graph: $2x + 1 > 7$

Answer: $x > 3$

Subtract 1: $2x > 6$; divide by 2: $x > 3$.

9. Solve and graph: $3x - 4 \leq 11$

Answer: $x \leq 5$

Add 4: $3x \leq 15$; divide by 3: $x \leq 5$.

10. Solve and graph: $-4x + 3 > -9$

Answer: $x < 3$

Subtract 3: $-4x > -12$; divide by -4 (flip): $x < 3$.