

Solving, Graphing and Modeling with Inequalities

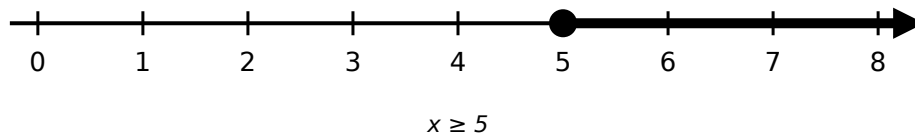
Grade 9 – Algebra 1 math · Test Answer Key · Standards: A-REI.B.3, A-CED.A.1, A-CED.A.3

Use this answer key to score the test. Give partial credit for correct algebra with a wrong sign direction, and accept either set-builder, inequality or interval notation unless a question asks for a particular form.

Standards: A-REI.B.3, A-CED.A.1, A-CED.A.3 · **Level:** Grade 9 Algebra 1

Question 1 One inequality (2 points)

Add 7: $4x \geq 20$. Divide by 4: $x \geq 5$.



$x \geq 5$

Scoring: 1 point for the solution, 1 point for a correct graph.

Question 2 Negative divisor (2 points)

Subtract 5: $-3x < 12$. Divide by -3 and reverse the sign: $x > -4$.

$x > -4$

Scoring: 1 point for isolating $-3x$, 1 point for the reversed sign and answer.

Question 3 Distribute and compare (2 points)

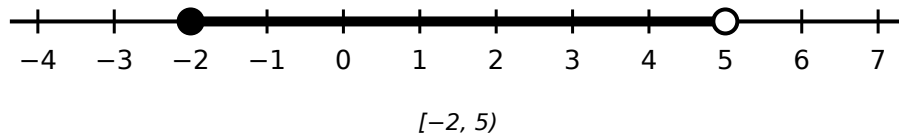
$4x + 12 \geq 7x - 9$. Subtract $4x$: $12 \geq 3x - 9$. Add 9: $21 \geq 3x$. So $x \leq 7$.

$x \leq 7$

Scoring: 1 point for distributing and collecting terms, 1 point for the answer.

Question 4 An and inequality (2 points)

Subtract 1: $-6 \leq 3x < 15$. Divide by 3: $-2 \leq x < 5$.



$-2 \leq x < 5$, or $[-2, 5)$

Scoring: 1 point for the compound solution, 1 point for the notation.

Question 5 An or inequality (2 points)

First: $2x \leq -6$, so $x \leq -3$. Second: $x > 4$.

$x \leq -3$ or $x > 4$, or $(-\infty, -3] \cup (4, \infty)$

Scoring: 1 point per part.

Question 6 Read the segment (2 points)

Open at -6 and closed at 1 .

$-6 < x \leq 1$, or $(-6, 1]$

Scoring: 1 point for the inequality, 1 point for the interval notation.

Question 7 Read the ray (2 points)

Closed at 3 with the shading to the right: $x \geq 3$.

Solution example: 3 (or 10). Non-solution example: 2 .

$x \geq 3$

Scoring: 1 point for the inequality, 1 point for correct examples.

Question 8 Band fundraiser (3 points)

(a) $420 + 4.5b \geq 1,500$.

(b) $4.5b \geq 1,080$, so $b \geq 240$.

(c) 240 boxes give exactly \$1,500.

At least 240 boxes

Scoring: 1 point per part.

Question 9 Daily calories (3 points)

(a) $2,200 \leq 600 + 180n \leq 3,000$.

(b) $1,600 \leq 180n \leq 2,400$, so $8.89 \leq n \leq 13.33$ (rounded).

(c) Whole numbers: 9, 10, 11, 12, 13.

Check: 9 bars give 2,220 and 13 bars give 2,940.

9 to 13 bars

Scoring: 1 point per part.