

# Solving, Graphing and Modeling with Inequalities

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

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Class: \_\_\_\_\_

This test has 9 questions worth 20 points in total. Show every step, graph where asked and write constraint answers as whole numbers when the situation requires it. A calculator is allowed. Plan on about 45 minutes.

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

Time: 45 minutes · 9 questions · Total: 20 points · Calculator: as allowed by your teacher

## Question 1 One inequality (2 points)

Solve  $4x - 7 \geq 13$  and graph the solution on a number line.

## Question 2 Negative divisor (2 points)

Solve  $-3x + 5 < 17$ .

## Question 3 Distribute and compare (2 points)

Solve  $4(x + 3) \geq 7x - 9$ .

## Question 4 An and inequality (2 points)

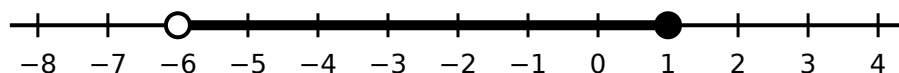
Solve  $-5 \leq 3x + 1 < 16$  and write the answer in interval notation.

## Question 5 An or inequality (2 points)

Solve  $2x - 3 \leq -9$  or  $5x > 20$  and describe the solution set.

## Question 6 Read the segment (2 points)

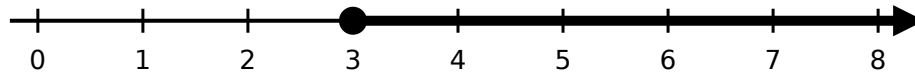
Write the compound inequality and the interval notation for the graph.



*A graph on a number line.*

**Question 7 Read the ray (2 points)**

Write the inequality for the graph, then name one integer that is a solution and one that is not.



*A graph on a number line.*

**Question 8 Band fundraiser (3 points)**

A school band needs at least \$1,500 for a trip. It has \$420 and earns \$4.50 profit on each box of popcorn sold. (a) Write an inequality. (1 point) (b) Solve it. (1 point) (c) State the least number of boxes. (1 point)

**Question 9 Daily calories (3 points)**

A hiker needs between 2,200 and 3,000 calories per day, inclusive. She eats 600 calories at meals and the rest from trail bars of 180 calories each. (a) Write a compound inequality for the number of bars  $n$ . (1 point) (b) Solve it. (1 point) (c) List the possible whole numbers of bars. (1 point)