

Solving and Graphing Two-Step Inequalities

Grade 7 math · Worksheet · Standards: 7.EE.B.4b

Name: _____ Date: _____ Class: _____

These problems train standard 7.EE.B.4b: solving inequalities of the form $px + q > r$ and $px + q < r$, graphing the solution sets and interpreting them. Whole numbers come first, followed by negative coefficients, decimals and fractions.

Every time you multiply or divide by a negative number, stop and reverse the inequality sign. Finish each solution by testing one number from the shaded ray in the original inequality.

Standards: 7.EE.B.4b · **Level:** Grade 7

Problem 1 Add, Then Divide (easy)

Solve $3x + 4 > 19$.

Problem 2 Subtract, Then Divide (easy)

Solve $2x - 7 < 9$.

Problem 3 Graph a Simple Inequality (easy)

Graph $x < 3$ on the number line.



Blank number line.

Problem 4 A Quotient Inequality (easy)

Solve $\frac{x}{5} + 2 > 6$.

Problem 5 First Negative Coefficient (medium)

Solve $-2x + 3 > 11$ and graph the solution.



Blank number line.

Problem 6 Negative Coefficient with Subtraction (medium)

Solve $-5x - 10 < 20$.

Problem 7 Decimal Coefficient (medium)

Solve $0.5x - 2.5 < 3$.

Problem 8 Decimals on Both Sides of the Sign (medium)

Solve $1.2x + 3.6 > 9.6$.

Problem 9 Fraction Coefficient (medium)

Find every value of x that makes $\frac{5}{6}x + 3 > 13$ true, and test one value from your answer.

Problem 10 Negative Quotient (medium)

Solve $-\frac{x}{4} + 1 > 3$.

Problem 11 Parentheses and a Positive Factor (medium)

Solve $3(x - 2) > 12$.

Problem 12 From Graph to Inequality (medium)

The graph shows the solution set of an inequality. Write the inequality, then show that $2x + 5 < 3$ has this solution set.



A graphed solution set.

Problem 13 Negative Factor Outside (hard)

Solve $-2(x + 3) < 10$.

Problem 14 Variable on the Right Side (hard)

Solve $18 > 7 - 2.5x$.

Problem 15 Club Fundraiser Goal (medium)

A club has \$60 and earns \$8 profit on each T-shirt sold. It wants more than \$240. Write and solve an inequality for the number of shirts n , then state the least whole number of shirts.

Problem 16 Texting Plan Budget (medium)

A phone plan costs \$20 per month plus \$0.05 per text. Maria wants her bill to be less than \$35. Write and solve an inequality for the number of texts t .

Problem 17 Diver Ascent (hard)

A diver at -12 feet rises 4 feet each minute. After m minutes the diver must be shallower than -2 feet, meaning higher than -2 . Write and solve an inequality, and graph the solution.



Blank number line.

Problem 18 Bus Rental Budget (hard)

A school bus rental costs \$150 plus \$2.25 per mile. The trip budget is under \$375. Write and solve an inequality for the number of miles m , and interpret the answer.

Problem 19 Draining the Pool (hard)

A pool holds 600 gallons and drains 15 gallons each minute. For how many minutes t will the pool hold fewer than 270 gallons? Write and solve an inequality, and graph the solution.



Blank number line.

Problem 20 Markers with Tax (hard)

Mr. Ortiz buys 4 packs of markers. Each pack costs m dollars plus \$1.25 in tax, and he has \$30. Write an inequality for the total cost being less than \$30, solve it, and describe the possible prices.