

Inequality Practice Problems Solutions

Solve the following inequalities. Write your answer in interval notation.

1.

$$5x - 8 > 12$$

$$5x > 20$$

$$x > 4$$

$$(4, \infty)$$

Here, x was multiplied by 5, then 8 was subtracted to get it to be greater than 12. So undo that by adding 8 first. Then divide by 5. The sign doesn't change since we never divided or multiplied by a negative number. The interval notation is written on the last line.

2.

$$-4(5 - 2x) \leq 13$$

$$-20 + 8x \leq 13$$

$$8x \leq 33$$

$$x \leq 4.125$$

$$(-\infty, 4.125]$$

The x is buried within the parentheses. Distribute the -4 through to unbury it. Then add 20 to both sides and divide by 8. Notice the interval notation includes the 4.125 in the solution since the inequality sign is "less than **or equal to**". This solution did not involve multiplying or dividing by a negative number, so we did not switch the signs.

3.

$$3 < \frac{2x - 4}{7} < 10$$

$$21 < 2x - 4 < 70$$

$$25 < 2x < 74$$

$$12.5 < x < 37$$

$$(12.5, 37)$$

Here, we undo what was done to the x in the middle. Multiply by 7 to undo the division by 7. Notice you do this to all three parts, the 3 on the left, the fraction in the middle, and the 10 on the right. Then add 4 and divide by 2. You see that if x is in between 12.5 and 37, then the original inequality will be true.