

This key should allow you to understand why you choose the option you did (beyond just getting a question right or wrong). More instructions on how to use this key can be found [here](#).

If you have a suggestion to make the keys better, please fill out the short survey [here](#).

Note: This key is auto-generated and may contain issues and/or errors. The keys are reviewed after each exam to ensure grading is done accurately. If there are issues (like duplicate options), they are noted in the offline gradebook. The keys are a work-in-progress to give students as many resources to improve as possible.

- Using an interval or intervals, describe all the x -values within or including a distance of the given values.

More than 9 units from the number -5 .

The solution is $(-\infty, -14) \cup (4, \infty)$.

Plausible alternative answers include: This describes the values no more than 9 from -5 This describes the values more than 9 from -5 This describes the values less than 9 from -5 This describes the values no less than 9 from -5 You likely thought the values in the interval were not correct.

General Comment: When thinking about this language, it helps to draw a number line and try points.

- Solve the linear inequality below.

$$-9 - 7x \leq \frac{-20x + 4}{8} < 9 - 3x$$

The solution is $[-2.11, 17.00)$.

Plausible alternative answers include: $(-\infty, -2.11] \cup (17.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality. $(-\infty, -2.11) \cup [17.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality. $[-2.11, 17.00)$, which is the correct option. $(-2.11, 17.00]$, which corresponds to flipping the inequality.

General Comment: To solve, you will need to break up the compound inequality into two inequalities. Be sure to keep track of the inequality! It may be best to draw a number line and graph your solution.

- Solve the linear inequality below.

$$-9x + 8 \geq -6x - 4$$

The solution is $(-\infty, 4.0]$.

Plausible alternative answers include: $(-\infty, 4.0]$, which is the correct option. $[4.0, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative! $[-4.0, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly. $(-\infty, -4.0]$, which corresponds to negating the endpoint of the solution. You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

4. Solve the linear inequality below.

$$-8 + 3x > 5x \text{ or } -3 + 6x < 9x$$

The solution is $(-\infty, -4.0)$ or $(-1.0, \infty)$.

Plausible alternative answers include: Corresponds to including the endpoints (when they should be excluded). Corresponds to inverting the inequality and negating the solution. Corresponds to including the endpoints AND negating. * Correct option. Corresponds to the variable canceling, which does not happen in this instance.

General Comment: When multiplying or dividing by a negative, flip the sign.

5. Solve the linear inequality below.

$$-9x + 8 \geq 5x - 4$$

The solution is $(-\infty, 0.857]$.

Plausible alternative answers include: $(-\infty, -0.857]$, which corresponds to negating the endpoint of the solution. $[-0.857, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly. $[0.857, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative! * $(-\infty, 0.857]$, which is the correct option. You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

6. Solve the linear inequality below.

$$\frac{8}{6} + \frac{7}{4}x < \frac{8}{7}x - \frac{8}{5}$$

The solution is $(-\infty, -4.831)$.

Plausible alternative answers include: * $(-\infty, -4.831)$, which is the correct option. $(-\infty, 4.831)$, which corresponds to negating the endpoint of the solution. $(-4.831, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative! $(4.831, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly. You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

7. Solve the linear inequality below.

$$-4 + 3x > 4x \text{ or } -3 + 6x < 8x$$

The solution is $(-\infty, -4.0)$ or $(-1.5, \infty)$.

Plausible alternative answers include: Corresponds to inverting the inequality and negating the solution. Corresponds to including the endpoints AND negating. * Correct option. Corresponds to including the endpoints (when they should be excluded). Corresponds to the variable canceling, which does not happen in this instance.

General Comment: When multiplying or dividing by a negative, flip the sign.

8. Solve the linear inequality below.

$$-9 - 9x \leq \frac{-50x + 5}{9} < 6 - 6x$$

The solution is $[-2.77, 12.25)$.

Plausible alternative answers include: $(-\infty, -2.77] \cup (12.25, \infty)$, which corresponds to displaying the and-inequality as an or-inequality. $[-2.77, 12.25)$, which is the correct option. $(-\infty, -2.77) \cup [12.25, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality. $(-2.77, 12.25]$, which corresponds to flipping the inequality.

General Comment: To solve, you will need to break up the compound inequality into two inequalities. Be sure to keep track of the inequality! It may be best to draw a number line and graph your solution.

9. Solve the linear inequality below.

$$\frac{-4}{2} - \frac{3}{9}x < \frac{3}{3}x + \frac{10}{8}$$

The solution is $(-2.438, \infty)$.

Plausible alternative answers include: $(-\infty, -2.438)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative! $(-\infty, 2.438)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly. $(2.438, \infty)$, which corresponds to negating the endpoint of the solution. * $(-2.438, \infty)$, which is the correct option. You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

10. Using an interval or intervals, describe all the x -values within or including a distance of the given values.

Less than 4 units from the number -3 .

The solution is $(-7, 1)$.

Plausible alternative answers include: This describes the values no more than 4 from -3 This describes the values less than 4 from -3 This describes the values no less than 4 from -3 This describes the values more than 4 from -3 You likely thought the values in the interval were not correct.

General Comment: When thinking about this language, it helps to draw a number line and try points.
