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.

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

   No less than 8 units from the number 4.

   The solution is $(-\infty, -4] \cup [12, \infty)$.

   Plausible alternative answers include: This describes the values less than 8 from 4 This describes the values no less than 8 from 4 This describes the values more than 8 from 4 This describes the values no more than 8 from 4 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.

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2. Solve the linear inequality below.

$$-8 + 6x \leq \frac{59x - 9}{9} < 8 + 3x$$

   The solution is $[-12.60, 2.53)$.

   Plausible alternative answers include:$[-12.60, 2.53)$, which is the correct option. $(-12.60, 2.53]$, which corresponds to flipping the inequality. $(-\infty, -12.60] \cup (2.53, \infty)$, which corresponds to displaying the and-inequality as an or-inequality. $(-\infty, -12.60) \cup [2.53, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND 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.

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3. Solve the linear inequality below.

$$-5x + 7 \geq 3x - 4$$

   The solution is $(-\infty, 1.375]$.

   Plausible alternative answers include: $[1.375, \infty)$, 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! * $(-\infty, 1.375]$, which is the correct option. $[-1.375, \infty)$, 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. $(-\infty, -1.375]$, 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.

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4. Solve the linear inequality below.

$$9 - 4x > 5x \text{ or } 3 + 4x < 5x$$

The solution is $(-\infty, 1.0)$ or $(3.0, \infty)$.

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

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

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5. Solve the linear inequality below.

$$-7x - 7 \leq 10x + 10$$

The solution is $[-1.0, \infty)$.

Plausible alternative answers include:* $[-1.0, \infty)$, which is the correct option. $(-\infty, 1.0]$, 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. $(-\infty, -1.0]$, 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! $[1.0, \infty)$, 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.

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6. Solve the linear inequality below.

$$\frac{-3}{6} + \frac{5}{4}x \geq \frac{10}{9}x - \frac{6}{8}$$

The solution is $[-1.8, \infty)$.

Plausible alternative answers include: $(-\infty, -1.8]$, 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! $[1.8, \infty)$, which corresponds to negating the endpoint of the solution. * $[-1.8, \infty)$, which is the correct option. $(-\infty, 1.8]$, 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.

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7. Solve the linear inequality below.

$$-8 + 8x > 9x \text{ or } -7 + 8x < 11x$$

The solution is $(-\infty, -8.0)$ or $(-2.333, \infty)$.

Plausible alternative answers include: Corresponds to inverting the inequality and negating the solution. Corresponds to including the endpoints (when they should be excluded). 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.

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8. Solve the linear inequality below.

$$4 - 4x < \frac{-8x + 3}{3} \leq 6 - 4x$$

The solution is $(2.25, 3.75]$.

Plausible alternative answers include:$[2.25, 3.75)$, which corresponds to flipping the inequality. $(-\infty, 2.25) \cup [3.75, \infty)$, which corresponds to displaying the and-inequality as an or-inequality. $(-\infty, 2.25] \cup (3.75, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality. * $(2.25, 3.75]$, which is the correct option.

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.

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9. Solve the linear inequality below.

$$\frac{-5}{4} - \frac{8}{7}x \geq \frac{4}{9}x + \frac{9}{5}$$

The solution is $(-\infty, -1.921]$.

Plausible alternative answers include: $[1.921, \infty)$, 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. $[-1.921, \infty)$, 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! * $(-\infty, -1.921]$, which is the correct option. $(-\infty, 1.921]$, 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.

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

No less than 2 units from the number 7.

The solution is $(-\infty, 5] \cup [9, \infty)$.

Plausible alternative answers include: This describes the values no more than 2 from 7 This describes the values no less than 2 from 7 This describes the values less than 2 from 7 This describes the values more than 2 from 7 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.
