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. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-9 - 5x \leq \frac{25x + 5}{5} < 3 + 4x$$

The solution is None of the above., which is option E.

A. $(-\infty, a) \cup [b, \infty)$, where $a \in [0, 4]$ and $b \in [-3, 1]$

$(-\infty, 1.00) \cup [-2.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

B. $(a, b]$, where $a \in [0.1, 2.8]$ and $b \in [-4, -1]$

$(1.00, -2.00]$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

C. $[a, b)$, where $a \in [0, 7]$ and $b \in [-2, 1]$

$[1.00, -2.00)$, which is the correct interval but negatives of the actual endpoints.

D. $(-\infty, a] \cup (b, \infty)$, where $a \in [0.6, 1.6]$ and $b \in [-3.4, -0.1]$

$(-\infty, 1.00] \cup (-2.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

E. None of the above.

* This is correct as the answer should be $[-1.00, 2.00)$.

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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2. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{7}{8} - \frac{8}{4}x > \frac{-5}{3}x - \frac{6}{9}$$

The solution is $(-\infty, 4.625)$, which is option C.

A. $(-\infty, a)$, where $a \in [-5.62, -2.62]$

$(-\infty, -4.625)$, which corresponds to negating the endpoint of the solution.

B. (a, ∞), where $a \in [2.62, 5.62]$

$(4.625, \infty)$, 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!

C. $(-\infty, a)$, where $a \in [3.62, 9.62]$

* $(-\infty, 4.625)$, which is the correct option.

D. (a, ∞), where $a \in [-5.62, -1.62]$

$(-4.625, \infty)$, 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.

E. None of the above.

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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3. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-4 + 8x > 11x \text{ or } 9 + 7x < 8x$$

The solution is $(-\infty, -1.333)$ or $(9.0, \infty)$, which is option D.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-13, -6]$ and $b \in [-3.67, 2.33]$

Corresponds to including the endpoints AND negating.

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [-9, -6]$ and $b \in [0.33, 2.33]$

Corresponds to inverting the inequality and negating the solution.

C. $(-\infty, a] \cup [b, \infty)$, where $a \in [-5.33, -0.33]$ and $b \in [8, 10]$

Corresponds to including the endpoints (when they should be excluded).

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [-2.33, 0.67]$ and $b \in [7, 13]$

* Correct option.

E. $(-\infty, \infty)$

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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4. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-9x + 7 \geq -4x + 10$$

The solution is $(-\infty, -0.6]$, which is option C.

A. $(-\infty, a]$, where $a \in [-0.33, 0.62]$

$(-\infty, 0.6]$, which corresponds to negating the endpoint of the solution.

B. $[a, \infty)$, where $a \in [-3, 0.2]$

$[-0.6, \infty)$, 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!

C. $(-\infty, a]$, where $a \in [-0.96, 0.24]$

* $(-\infty, -0.6]$, which is the correct option.

D. $[a, \infty)$, where $a \in [0.1, 1.1]$

$[0.6, \infty)$, 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.

E. None of the above.

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

$$\text{More than 6 units from the number } -9.$$

The solution is $(-\infty, -15) \cup (-3, \infty)$, which is option A.

A. $(-\infty, -15) \cup (-3, \infty)$

This describes the values more than 6 from -9

B. $[-15, -3]$

This describes the values no more than 6 from -9

C. $(-15, -3)$

This describes the values less than 6 from -9

D. $(-\infty, -15] \cup [-3, \infty)$

This describes the values no less than 6 from -9

E. None of the above

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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6. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{7}{4} - \frac{3}{6}x \geq \frac{5}{2}x - \frac{4}{3}$$

The solution is $(-\infty, 1.028]$, which is option D.

A. $(-\infty, a]$, where $a \in [-4.03, -0.03]$

$(-\infty, -1.028]$, which corresponds to negating the endpoint of the solution.

B. $[a, \infty)$, where $a \in [0.9, 2.8]$

$[1.028, \infty)$, 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!

C. $[a, \infty)$, where $a \in [-2.4, 0.3]$

$[-1.028, \infty)$, 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.

D. $(-\infty, a]$, where $a \in [0.03, 5.03]$

  * $(-\infty, 1.028]$, which is the correct option.

E. None of the above.

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

No more than 3 units from the number 4.

The solution is $[1, 7]$, which is option C.

A. $(1, 7)$

  This describes the values less than 3 from 4

B. $(-\infty, 1] \cup [7, \infty)$

  This describes the values no less than 3 from 4

C. $[1, 7]$

  This describes the values no more than 3 from 4

D. $(-\infty, 1) \cup (7, \infty)$

  This describes the values more than 3 from 4

E. None of the above

  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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8. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-9 + 8x < \frac{75x + 9}{9} \leq -8 + 6x$$

The solution is $(-30.00, -3.86]$, which is option A.

A. $(a, b]$, where $a \in [-31, -28]$ and $b \in [-4.86, -1.86]$

  * $(-30.00, -3.86]$, which is the correct option.

B. $(-\infty, a] \cup (b, \infty)$, where $a \in [-35, -29]$ and $b \in [-6.86, 1.14]$

  $(-\infty, -30.00] \cup (-3.86, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality.

C. $[a, b)$, where $a \in [-31, -27]$ and $b \in [-6.86, 0.14]$

  $[-30.00, -3.86)$, which corresponds to flipping the inequality.

D. $(-\infty, a) \cup [b, \infty)$, where $a \in [-33, -29]$ and $b \in [-5.86, -0.86]$

  $(-\infty, -30.00) \cup [-3.86, \infty)$, which corresponds to displaying the and-inequality as an or-inequality.

E. None of the above.

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. Then, choose the constant and interval combination that describes the solution set.

$$9 + 4x > 6x \text{ or } 9 + 7x < 8x$$

The solution is $(-\infty, 4.5)$ or $(9.0, \infty)$, which is option B.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [3.5, 6.5]$ and $b \in [7, 10]$

Corresponds to including the endpoints (when they should be excluded).

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [3.5, 5.5]$ and $b \in [5, 10]$

* Correct option.

C. $(-\infty, a] \cup [b, \infty)$, where $a \in [-9, -7]$ and $b \in [-5.5, -3.5]$

Corresponds to including the endpoints AND negating.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [-10, -7]$ and $b \in [-8.5, -1.5]$

Corresponds to inverting the inequality and negating the solution.

E. $(-\infty, \infty)$

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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10. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-8x + 3 < -4x - 10$$

The solution is $(3.25, \infty)$, which is option C.

A. (a, ∞), where $a \in [-3.25, -0.25]$

$(-3.25, \infty)$, which corresponds to negating the endpoint of the solution.

B. $(-\infty, a)$, where $a \in [-2.75, 10.25]$

$(-\infty, 3.25)$, 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!

C. (a, ∞), where $a \in [2.25, 7.25]$

* $(3.25, \infty)$, which is the correct option.

D. $(-\infty, a)$, where $a \in [-3.25, 1.75]$

$(-\infty, -3.25)$, 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.

E. None of the above.

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.
