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.

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

The solution is $(-\infty, -1.316)$, which is option C.

A. (a, ∞), where $a \in [0.32, 3.32]$

$(1.316, \infty)$, 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.

B. $(-\infty, a)$, where $a \in [0.32, 2.32]$

$(-\infty, 1.316)$, which corresponds to negating the endpoint of the solution.

C. $(-\infty, a)$, where $a \in [-6.32, 0.68]$

* $(-\infty, -1.316)$, which is the correct option.

D. (a, ∞), where $a \in [-3.32, -0.32]$

$(-1.316, \infty)$, 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!

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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2. 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 $(-\infty, -12] \cup [4, \infty)$, which is option B.

A. $(-\infty, -12) \cup (4, \infty)$

This describes the values more than 8 from -4

B. $(-\infty, -12] \cup [4, \infty)$

This describes the values no less than 8 from -4

C. $[-12, 4]$

This describes the values no more than 8 from -4

D. $(-12, 4)$

This describes the values less than 8 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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3. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-8 + 9x < \frac{32x + 6}{3} \leq -7 + 5x$$

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

A. $[a, b)$, where $a \in [4, 8]$ and $b \in [-1.41, 4.59]$

$[6.00, 1.59)$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

B. $(a, b]$, where $a \in [5, 8]$ and $b \in [0.59, 6.59]$

$(6.00, 1.59]$, which is the correct interval but negatives of the actual endpoints.

C. $(-\infty, a] \cup (b, \infty)$, where $a \in [6, 8]$ and $b \in [0.59, 7.59]$

$(-\infty, 6.00] \cup (1.59, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

D. $(-\infty, a) \cup [b, \infty)$, where $a \in [3, 8]$ and $b \in [0.6, 4]$

$(-\infty, 6.00) \cup [1.59, \infty)$, 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 $(-6.00, -1.59]$.

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

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

The solution is $(-\infty, -44.267)$, which is option A.

A. $(-\infty, a)$, where $a \in [-47.27, -42.27]$

* $(-\infty, -44.267)$, which is the correct option.

B. $(-\infty, a)$, where $a \in [43.27, 47.27]$

$(-\infty, 44.267)$, which corresponds to negating the endpoint of the solution.

C. (a, ∞), where $a \in [-44.27, -38.27]$

$(-44.267, \infty)$, 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!

D. (a, ∞), where $a \in [42.27, 48.27]$

$(44.267, \infty)$, 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. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-9x + 4 \geq 6x - 3$$

The solution is $(-\infty, 0.467]$, which is option A.

A. $(-\infty, a]$, where $a \in [0.3, 0.48]$

* $(-\infty, 0.467]$, which is the correct option.

B. $[a, \infty)$, where $a \in [-0.6, 0.1]$

$[-0.467, \infty)$, 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.

C. $(-\infty, a]$, where $a \in [-2.57, -0.12]$

$(-\infty, -0.467]$, which corresponds to negating the endpoint of the solution.

D. $[a, \infty)$, where $a \in [0.2, 4.3]$

$[0.467, \infty)$, 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!

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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6. 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. $[a, \infty)$, where $a \in [0.6, 2.6]$

$[0.6, \infty)$, 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.

B. $(-\infty, a]$, where $a \in [0.6, 2.6]$

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

C. $(-\infty, a]$, where $a \in [-4.6, 0.4]$

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

D. $[a, \infty)$, where $a \in [-3.6, 0.4]$

$[-0.6, \infty)$, 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!

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

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

The solution is $(-\infty, -1.0)$ or $(5.0, \infty)$, which is option C.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-5.3, -4.5]$ and $b \in [-3, 2]$

Corresponds to including the endpoints AND negating.

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [-5, -2]$ and $b \in [1, 2]$

Corresponds to inverting the inequality and negating the solution.

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-3, 1]$ and $b \in [2, 6]$

* Correct option.

D. $(-\infty, a] \cup [b, \infty)$, where $a \in [-2.2, -0.5]$ and $b \in [3, 6]$

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

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

More than 8 units from the number -6.

The solution is $(-\infty, -14) \cup (2, \infty)$, which is option C.

A. $[-14, 2]$

This describes the values no more than 8 from -6

B. $(-14, 2)$

This describes the values less than 8 from -6

C. $(-\infty, -14) \cup (2, \infty)$

This describes the values more than 8 from -6

D. $(-\infty, -14] \cup [2, \infty)$

This describes the values no less than 8 from -6

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

$$-5+7x>10x \text{ or } 8+6x<8x$$

The solution is $(-\infty,-1.667)$ or $(4.0,\infty)$, which is option D.

A. $(-\infty,a]\cup[b,\infty)$, where $a\in[-4,-3]$ and $b\in[1.6,2.5]$

Corresponds to including the endpoints AND negating.

B. $(-\infty,a)\cup(b,\infty)$, where $a\in[-4,-2]$ and $b\in[-0.33,3.67]$

Corresponds to inverting the inequality and negating the solution.

C. $(-\infty,a]\cup[b,\infty)$, where $a\in[-3.67,2.33]$ and $b\in[2.4,4.1]$

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

D. $(-\infty,a)\cup(b,\infty)$, where $a\in[-1.67,1.33]$ and $b\in[4,8]$

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

$$-5-6x<\frac{-34x-8}{6}\leq-3-6x$$

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

A. $(-\infty,a)\cup[b,\infty)$, where $a\in[7,12]$ and $b\in[2,7]$

$(-\infty,11.00)\cup[5.00,\infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

B. $(a,b]$, where $a\in[11,15]$ and $b\in[2,8]$

$(11.00,5.00]$, which is the correct interval but negatives of the actual endpoints.

C. $[a,b)$, where $a\in[9,14]$ and $b\in[4,8]$

$[11.00,5.00)$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

D. $(-\infty,a]\cup(b,\infty)$, where $a\in[11,13]$ and $b\in[3,7]$

$(-\infty,11.00]\cup(5.00,\infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

E. None of the above.

* This is correct as the answer should be $(-11.00,-5.00]$.

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.