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.

$$-9 + 3x > 5x \text{ or } 7 + 7x < 9x$$

The solution is $(-\infty, -4.5)$ or $(3.5, \infty)$, which is option D.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-5.15, -4]$ and $b \in [2.7, 3.9]$

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

B. $(-\infty, a] \cup [b, \infty)$, where $a \in [-4.24, -2.41]$ and $b \in [4.2, 5.7]$

Corresponds to including the endpoints AND negating.

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-3.7, -1.8]$ and $b \in [4.45, 5.54]$

Corresponds to inverting the inequality and negating the solution.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [-4.7, -4]$ and $b \in [2.64, 4.03]$

* 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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2. 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. $(-\infty, 1) \cup (7, \infty)$

This describes the values more 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. $(1, 7)$

This describes the values less 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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3. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

$$\text{No less than 6 units from the number } -10.$$

The solution is $(-\infty, -16] \cup [-4, \infty)$, which is option C.

A. $(-16, -4)$

This describes the values less than 6 from -10

B. $(-\infty, -16) \cup (-4, \infty)$

This describes the values more than 6 from -10

C. $(-\infty, -16] \cup [-4, \infty)$

This describes the values no less than 6 from -10

D. $[-16, -4]$

This describes the values no more than 6 from -10

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

$$-5 - 3x \leq \frac{-13x - 6}{6} < 8 - 3x$$

The solution is $[-4.80, 10.80)$, which is option C.

A. $(-\infty, a) \cup [b, \infty)$, where $a \in [-8.8, -3.8]$ and $b \in [9.8, 13.8]$

$(-\infty, -4.80) \cup [10.80, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality.

B. $(a, b]$, where $a \in [-7.8, 1.2]$ and $b \in [7.8, 11.8]$

$(-4.80, 10.80]$, which corresponds to flipping the inequality.

C. $[a, b)$, where $a \in [-6.8, -2.8]$ and $b \in [8.8, 12.8]$

$[-4.80, 10.80)$, which is the correct option.

D. $(-\infty, a] \cup (b, \infty)$, where $a \in [-7.8, -3.8]$ and $b \in [9.8, 12.8]$

$(-\infty, -4.80] \cup (10.80, \infty)$, 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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5. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

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

The solution is $[-6.296, \infty)$, which is option B.

A. $[a, \infty)$, where $a \in [5.3, 7.3]$

$[6.296, \infty)$, which corresponds to negating the endpoint of the solution.

B. $[a, \infty)$, where $a \in [-7.3, -4.3]$

* $[-6.296, \infty)$, which is the correct option.

C. $(-\infty, a]$, where $a \in [3.3, 10.3]$

$(-\infty, 6.296]$, 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 $a \in [-9.3, -5.3]$

$(-\infty, -6.296]$, 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.

$$9 + 4x < \frac{74x + 5}{9} \leq 9 + 8x$$

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

A. $(-\infty, a) \cup [b, \infty)$, where $a \in [-2, -1]$ and $b \in [-39, -37]$

$(-\infty, -2.00) \cup [-38.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

B. $(-\infty, a] \cup (b, \infty)$, where $a \in [-3, -1]$ and $b \in [-41, -35]$

$(-\infty, -2.00] \cup (-38.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

C. $[a, b)$, where $a \in [-2, 0]$ and $b \in [-39, -33]$

$[-2.00, -38.00)$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

D. $(a, b]$, where $a \in [-2, -1]$ and $b \in [-39, -37]$

$(-2.00, -38.00]$, which is the correct interval but negatives of the actual endpoints.

E. None of the above.

* This is correct as the answer should be $(2.00, 38.00]$.

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

$$\frac{9}{3} - \frac{6}{8}x \geq \frac{6}{7}x - \frac{8}{6}$$

The solution is $(-\infty, 2.696]$, which is option A.

A. $(-\infty, a]$, where $a \in [-0.3, 4.7]$

* $(-\infty, 2.696]$, which is the correct option.

B. $(-\infty, a]$, where $a \in [-3.7, -0.7]$

$(-\infty, -2.696]$, which corresponds to negating the endpoint of the solution.

C. $[a, \infty)$, where $a \in [-0.3, 3.7]$

$[2.696, \infty)$, 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. $[a, \infty)$, where $a \in [-2.7, -1.7]$

$[-2.696, \infty)$, 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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8. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-8 + 5x > 6x \text{ or } 7 + 3x < 4x$$

The solution is $(-\infty, -8.0)$ or $(7.0, \infty)$, which is option D.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-8.35, -7.78]$ and $b \in [4.9, 7.7]$

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

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [-7.74, -6.53]$ and $b \in [7.15, 8.15]$

Corresponds to inverting the inequality and negating the solution.

C. $(-\infty, a] \cup [b, \infty)$, where $a \in [-7.42, -6.53]$ and $b \in [7.9, 8.6]$

Corresponds to including the endpoints AND negating.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [-8.84, -7.14]$ and $b \in [6.55, 7.11]$

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

$$6x - 7 < 9x + 5$$

The solution is $(-4.0, \infty)$, which is option A.

A. (a, ∞), where $a \in [-14, 1]$

   * $(-4.0, \infty)$, which is the correct option.

B. $(-\infty, a)$, where $a \in [-6, -2]$

   $(-\infty, -4.0)$, 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!

C. (a, ∞), where $a \in [4, 7]$

   $(4.0, \infty)$, which corresponds to negating the endpoint of the solution.

D. $(-\infty, a)$, where $a \in [3, 6]$

   $(-\infty, 4.0)$, 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.

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

$$-8x + 4 \leq 7x + 5$$

The solution is $[-0.067, \infty)$, which is option D.

A. $[a, \infty)$, where $a \in [0.06, 0.38]$

   $[0.067, \infty)$, which corresponds to negating the endpoint of the solution.

B. $(-\infty, a]$, where $a \in [0.03, 0.1]$

   $(-\infty, 0.067]$, 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 $a \in [-0.12, -0.05]$

   $(-\infty, -0.067]$, 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. $[a, \infty)$, where $a \in [-0.27, 0.03]$

   * $[-0.067, \infty)$, 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.