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.

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

The solution is $(-\infty, 2.341]$, which is option C.

A. $[a, \infty)$, where $a \in [-1.5, 8.25]$

$[2.341, \infty)$, 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!

B. $(-\infty, a]$, where $a \in [-6, -0.75]$

$(-\infty, -2.341]$, which corresponds to negating the endpoint of the solution.

C. $(-\infty, a]$, where $a \in [0.75, 6]$

* $(-\infty, 2.341]$, which is the correct option.

D. $[a, \infty)$, where $a \in [-4.5, 0.75]$

$[-2.341, \infty)$, 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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2. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

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

The solution is $(-\infty, -8.0)$ or $(1.5, \infty)$, which is option D.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-11.25, -3.75]$ and $b \in [0.75, 6.75]$

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

B. $(-\infty, a] \cup [b, \infty)$, where $a \in [-4.5, 2.25]$ and $b \in [2.25, 9]$

Corresponds to including the endpoints AND negating.

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-3.75, 3]$ and $b \in [6.75, 9.75]$

Corresponds to inverting the inequality and negating the solution.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [-12, -3.75]$ and $b \in [-1.5, 7.5]$

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

$$9 - 9x < \frac{-49x + 9}{9} \leq 6 - 6x$$

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

A. $(-\infty, a) \cup [b, \infty)$, where $a \in [-3.75, -1.5]$ and $b \in [-11.25, -6.75]$

$(-\infty, -2.25) \cup [-9.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

B. $(a, b]$, where $a \in [-7.5, 0]$ and $b \in [-10.5, -7.5]$

$(-2.25, -9.00]$, which is the correct interval but negatives of the actual endpoints.

C. $(-\infty, a] \cup (b, \infty)$, where $a \in [-7.5, 1.5]$ and $b \in [-15.75, -4.5]$

$(-\infty, -2.25] \cup (-9.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

D. $[a, b)$, where $a \in [-3.75, 0.75]$ and $b \in [-9.75, -3]$

$[-2.25, -9.00)$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

E. None of the above.

* This is correct as the answer should be $(2.25, 9.00]$.

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

More than 10 units from the number -4.

The solution is $(-\infty, -14) \cup (6, \infty)$, which is option A.

A. $(-\infty, -14) \cup (6, \infty)$

This describes the values more than 10 from -4

B. $[-14, 6]$

This describes the values no more than 10 from -4

C. $(-14, 6)$

This describes the values less than 10 from -4

D. $(-\infty, -14] \cup [6, \infty)$

This describes the values no less than 10 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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5. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$8x - 7 < 10x + 7$$

The solution is $(-7.0, \infty)$, which is option C.

A. (a, ∞), where $a \in [7, 11]$

$(7.0, \infty)$, which corresponds to negating the endpoint of the solution.

B. $(-\infty, a)$, where $a \in [5, 8]$

$(-\infty, 7.0)$, 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.

C. (a, ∞), where $a \in [-10, -6]$

* $(-7.0, \infty)$, which is the correct option.

D. $(-\infty, a)$, where $a \in [-11, -1]$

$(-\infty, -7.0)$, 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!

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.

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

The solution is $(-\infty, -1.667)$ or $(8.0, \infty)$, which is option C.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-11.25, -7.5]$ and $b \in [-0.75, 5.25]$

Corresponds to including the endpoints AND negating.

B. $(-\infty, a] \cup [b, \infty)$, where $a \in [-3.75, 0.75]$ and $b \in [4.5, 9]$

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

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-4.5, 1.5]$ and $b \in [6.75, 15]$

* Correct option.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [-11.25, -3]$ and $b \in [0.75, 4.5]$

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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7. 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 5.

The solution is $(-\infty, -3) \cup (13, \infty)$, which is option B.

A. $[-3, 13]$

This describes the values no more than 8 from 5

B. $(-\infty, -3) \cup (13, \infty)$

This describes the values more than 8 from 5

C. $(-3, 13)$

This describes the values less than 8 from 5

D. $(-\infty, -3] \cup [13, \infty)$

This describes the values no less than 8 from 5

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.

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

The solution is $(-4.20, 5.40]$, which is option C.

A. $[a, b)$, where $a \in [-7.5, -0.75]$ and $b \in [2.25, 9]$

$[-4.20, 5.40)$, which corresponds to flipping the inequality.

B. $(-\infty, a] \cup (b, \infty)$, where $a \in [-5.25, 2.25]$ and $b \in [3, 10.5]$

$(-\infty, -4.20] \cup (5.40, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality.

C. $(a, b]$, where $a \in [-5.25, -1.5]$ and $b \in [5.25, 6]$

* $(-4.20, 5.40]$, which is the correct option.

D. $(-\infty, a) \cup [b, \infty)$, where $a \in [-7.5, 0.75]$ and $b \in [2.25, 6]$

$(-\infty, -4.20) \cup [5.40, \infty)$, 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.

$$-9x - 7 > -6x + 8$$

The solution is $(-\infty, -5.0)$, which is option B.

A. (a, ∞), where $a \in [-7, 0]$

$(-5.0, \infty)$, 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!

B. $(-\infty, a)$, where $a \in [-6, 1]$

* $(-\infty, -5.0)$, which is the correct option.

C. $(-\infty, a)$, where $a \in [4, 8]$

$(-\infty, 5.0)$, which corresponds to negating the endpoint of the solution.

D. (a, ∞), where $a \in [5, 8]$

$(5.0, \infty)$, 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.

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.

$$\frac{8}{3} - \frac{7}{6}x < \frac{-4}{4}x - \frac{10}{8}$$

The solution is $(23.5, \infty)$, which is option D.

A. $(-\infty, a)$, where $a \in [20.25, 25.5]$

$(-\infty, 23.5)$, 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!

B. (a, ∞), where $a \in [-24.75, -20.25]$

$(-23.5, \infty)$, which corresponds to negating the endpoint of the solution.

C. $(-\infty, a)$, where $a \in [-26.25, -20.25]$

$(-\infty, -23.5)$, 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. (a, ∞), where $a \in [21, 27.75]$

* $(23.5, \infty)$, 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.