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.

$$\frac{-5}{5} - \frac{7}{3}x > \frac{4}{7}x - \frac{8}{2}$$

The solution is $(-\infty, 1.033)$, which is option C.

A. $(-\infty, a)$, where $a \in [-1.2, 0.4]$

$(-\infty, -1.033)$, which corresponds to negating the endpoint of the solution.

B. (a, ∞), where $a \in [-3.03, -0.03]$

$(-1.033, \infty)$, 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 $a \in [-0.8, 2.8]$

* $(-\infty, 1.033)$, which is the correct option.

D. (a, ∞), where $a \in [-0.97, 2.03]$

$(1.033, \infty)$, 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. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-4 - 8x \leq \frac{-27x + 9}{8} < 4 - 4x$$

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

A. $(-\infty, a) \cup [b, \infty)$, where $a \in [-0.1, 1.3]$ and $b \in [-4.6, -0.6]$

$(-\infty, 1.11) \cup [-4.60, \infty)$, 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 $a \in [-0.7, 3.7]$ and $b \in [-4.6, -0.6]$

$[1.11, -4.60)$, which is the correct interval but negatives of the actual endpoints.

C. $(a, b]$, where $a \in [0.11, 6.11]$ and $b \in [-4.6, -2.6]$

$(1.11, -4.60]$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

D. $(-\infty, a] \cup (b, \infty)$, where $a \in [0.11, 7.11]$ and $b \in [-4.6, -3.6]$

$(-\infty, 1.11] \cup (-4.60, \infty)$, 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 $[-1.11, 4.60)$.

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

$$6 + 5x \leq \frac{26x + 4}{4} < 9 + 6x$$

The solution is $[3.33, 16.00)$, which is option C.

A. $(-\infty, a) \cup [b, \infty)$, where $a \in [3.33, 4.33]$ and $b \in [12, 17]$

$(-\infty, 3.33) \cup [16.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality.

B. $(a, b]$, where $a \in [1.33, 4.33]$ and $b \in [16, 17]$

$(3.33, 16.00]$, which corresponds to flipping the inequality.

C. $[a, b)$, where $a \in [2.33, 6.33]$ and $b \in [15, 21]$

$[3.33, 16.00)$, which is the correct option.

D. $(-\infty, a] \cup (b, \infty)$, where $a \in [2.33, 9.33]$ and $b \in [15, 18]$

$(-\infty, 3.33] \cup (16.00, \infty)$, 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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4. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{10}{7} - \frac{7}{4}x \leq \frac{-3}{3}x - \frac{8}{5}$$

The solution is $[4.038, \infty)$, which is option A.

A. $[a, \infty)$, where $a \in [0.04, 8.04]$

* $[4.038, \infty)$, which is the correct option.

B. $(-\infty, a]$, where $a \in [1.04, 5.04]$

$(-\infty, 4.038]$, 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 $a \in [-5.04, -3.04]$

$[-4.038, \infty)$, which corresponds to negating the endpoint of the solution.

D. $(-\infty, a]$, where $a \in [-12.04, -2.04]$

$(-\infty, -4.038]$, 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.

$$6x - 9 < 10x + 6$$

The solution is $(-3.75, \infty)$, which is option C.

A. $(-\infty, a)$, where $a \in [-7.75, -0.75]$

$(-\infty, -3.75)$, 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 $a \in [1.75, 6.75]$

$(3.75, \infty)$, which corresponds to negating the endpoint of the solution.

C. (a, ∞), where $a \in [-6.75, -0.75]$

* $(-3.75, \infty)$, which is the correct option.

D. $(-\infty, a)$, where $a \in [-2.25, 7.75]$

$(-\infty, 3.75)$, 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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6. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-6 + 9x > 10x \text{ or } 3 + 7x < 10x$$

The solution is $(-\infty, -6.0)$ or $(1.0, \infty)$, which is option C.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-2, 0]$ and $b \in [4, 8]$

Corresponds to including the endpoints AND negating.

B. $(-\infty, a] \cup [b, \infty)$, where $a \in [-7, -2]$ and $b \in [1, 3]$

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

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-8, -4]$ and $b \in [-5, 4]$

* Correct option.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [-3, 2]$ and $b \in [4, 9]$

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.

$$\text{No more than 9 units from the number } -9.$$

The solution is $[-18, 0]$, which is option C.

A. $(-\infty, -18] \cup [0, \infty)$

This describes the values no less than 9 from -9

B. $(-18, 0)$

This describes the values less than 9 from -9

C. $[-18, 0]$

This describes the values no more than 9 from -9

D. $(-\infty, -18) \cup (0, \infty)$

This describes the values more than 9 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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8. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

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

The solution is $(-\infty, -6.0)$ or $(9.0, \infty)$, which is option C.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-9, -7]$ and $b \in [5.7, 7.9]$

Corresponds to including the endpoints AND negating.

B. $(-\infty, a] \cup [b, \infty)$, where $a \in [-7, -4]$ and $b \in [8.7, 9.6]$

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

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-8, -3]$ and $b \in [9, 13]$

* Correct option.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [-9, -7]$ and $b \in [6, 7]$

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

No more than 5 units from the number 3.

The solution is $[-2, 8]$, which is option B.

A. $(-2, 8)$

This describes the values less than 5 from 3

B. $[-2, 8]$

This describes the values no more than 5 from 3

C. $(-\infty, -2] \cup [8, \infty)$

This describes the values no less than 5 from 3

D. $(-\infty, -2) \cup (8, \infty)$

This describes the values more than 5 from 3

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

$$-10x - 7 \geq -6x + 5$$

The solution is $(-\infty, -3.0]$, which is option B.

A. $(-\infty, a]$, where $a \in [2, 5]$

$(-\infty, 3.0]$, which corresponds to negating the endpoint of the solution.

B. $(-\infty, a]$, where $a \in [-3, -1]$

* $(-\infty, -3.0]$, which is the correct option.

C. $[a, \infty)$, where $a \in [-4, 0]$

$[-3.0, \infty)$, 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!

D. $[a, \infty)$, where $a \in [1, 4]$

$[3.0, \infty)$, 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.
