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.

$$-6x + 3 \leq 8x - 7$$

The solution is $[0.714, \infty)$, which is option A.

A. $[a, \infty)$, where $a \in [-0.6, 0.94]$

* $[0.714, \infty)$, which is the correct option.

B. $(-\infty, a]$, where $a \in [-5.71, 0.29]$

$(-\infty, -0.714]$, 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. $[a, \infty)$, where $a \in [-1.54, -0.24]$

$[-0.714, \infty)$, which corresponds to negating the endpoint of the solution.

D. $(-\infty, a]$, where $a \in [0.71, 1.71]$

$(-\infty, 0.714]$, 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.

$$-5x - 6 \leq 10x - 3$$

The solution is $[-0.2, \infty)$, which is option A.

A. $[a, \infty)$, where $a \in [-0.64, -0.18]$

* $[-0.2, \infty)$, which is the correct option.

B. $(-\infty, a]$, where $a \in [-0.82, 0.04]$

$(-\infty, -0.2]$, 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 $a \in [-0.1, 0.68]$

$[0.2, \infty)$, which corresponds to negating the endpoint of the solution.

D. $(-\infty, a]$, where $a \in [0.02, 0.52]$

$(-\infty, 0.2]$, 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.

$$-9 + 8x > 10x \text{ or } -8 + 8x < 11x$$

The solution is $(-\infty, -4.5)$ or $(-2.667, \infty)$, which is option B.

A. $(-\infty, a) \cup (b, \infty)$, where $a \in [0.67, 3.67]$ and $b \in [1.5, 6.5]$

Corresponds to inverting the inequality and negating the solution.

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [-6.5, -2.5]$ and $b \in [-8.67, 0.33]$

* Correct option.

C. $(-\infty, a] \cup [b, \infty)$, where $a \in [-4.5, -3.5]$ and $b \in [-2.67, 1.33]$

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

D. $(-\infty, a] \cup [b, \infty)$, where $a \in [1.67, 4.67]$ and $b \in [3.5, 5.5]$

Corresponds to including the endpoints AND negating.

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.

$$6 - 8x < \frac{-43x + 8}{6} \leq 8 - 8x$$

The solution is $(5.60, 8.00]$, which is option B.

A. $(-\infty, a] \cup (b, \infty)$, where $a \in [5.6, 7.6]$ and $b \in [5, 12]$

$(-\infty, 5.60] \cup (8.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality.

B. $(a, b]$, where $a \in [2.6, 7.6]$ and $b \in [8, 10]$

* $(5.60, 8.00]$, which is the correct option.

C. $[a, b)$, where $a \in [-0.4, 7.6]$ and $b \in [5, 10]$

$[5.60, 8.00)$, which corresponds to flipping the inequality.

D. $(-\infty, a) \cup [b, \infty)$, where $a \in [2.6, 6.6]$ and $b \in [8, 9]$

$(-\infty, 5.60) \cup [8.00, \infty)$, 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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5. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

$$\text{No more than 6 units from the number } -1.$$

The solution is $[-7, 5]$, which is option A.

A. $[-7, 5]$

This describes the values no more than 6 from -1

B. $(-\infty, -7) \cup (5, \infty)$

This describes the values more than 6 from -1

C. $(-\infty, -7] \cup [5, \infty)$

This describes the values no less than 6 from -1

D. $(-7, 5)$

This describes the values less than 6 from -1

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

$$\text{No more than 7 units from the number } -8.$$

The solution is $[-15, -1]$, which is option A.

A. $[-15, -1]$

This describes the values no more than 7 from -8

B. $(-15, -1)$

This describes the values less than 7 from -8

C. $(-\infty, -15] \cup [-1, \infty)$

This describes the values no less than 7 from -8

D. $(-\infty, -15) \cup (-1, \infty)$

This describes the values more than 7 from -8

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

$$-8 + 3x > 5x \text{ or } -6 + 6x < 9x$$

The solution is $(-\infty, -4.0)$ or $(-2.0, \infty)$, which is option C.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-6, -2]$ and $b \in [-7, 0]$

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

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [0, 7]$ and $b \in [1, 7]$

Corresponds to inverting the inequality and negating the solution.

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-4, -2]$ and $b \in [-5, 3]$

* Correct option.

D. $(-\infty, a] \cup [b, \infty)$, where $a \in [-2, 3]$ and $b \in [3, 10]$

Corresponds to including the endpoints AND negating.

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

$$\frac{-4}{2} + \frac{5}{3}x \leq \frac{7}{6}x + \frac{4}{9}$$

The solution is $(-\infty, 4.889]$, which is option D.

A. $(-\infty, a]$, where $a \in [-7.89, -0.89]$

$(-\infty, -4.889]$, which corresponds to negating the endpoint of the solution.

B. $[a, \infty)$, where $a \in [-7.89, -3.89]$

$[-4.889, \infty)$, 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. $[a, \infty)$, where $a \in [2.89, 5.89]$

$[4.889, \infty)$, 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. $(-\infty, a]$, where $a \in [3.89, 5.89]$

* $(-\infty, 4.889]$, 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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9. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-4+8x \leq \frac{68x+6}{8} < 8+6x$$

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

A. $(-\infty, a) \cup [b, \infty)$, where $a \in [7.5, 12.5]$ and $b \in [-4.9, 0.1]$

$(-\infty, 9.50) \cup [-2.90, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

B. $(-\infty, a] \cup (b, \infty)$, where $a \in [8.5, 10.5]$ and $b \in [-4.9, -1.9]$

$(-\infty, 9.50] \cup (-2.90, \infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

C. $[a, b)$, where $a \in [6.5, 10.5]$ and $b \in [-2.9, -1.9]$

$[9.50, -2.90)$, which is the correct interval but negatives of the actual endpoints.

D. $(a, b]$, where $a \in [9.5, 16.5]$ and $b \in [-3.9, 2.1]$

$(9.50, -2.90]$, 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 $[-9.50, 2.90)$.

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

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

The solution is $[-1.962, \infty)$, which is option C.

A. $(-\infty, a]$, where $a \in [1.96, 5.96]$

$(-\infty, 1.962]$, 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. $[a, \infty)$, where $a \in [0.96, 4.96]$

$[1.962, \infty)$, which corresponds to negating the endpoint of the solution.

C. $[a, \infty)$, where $a \in [-2.96, -0.96]$

* $[-1.962, \infty)$, which is the correct option.

D. $(-\infty, a]$, where $a \in [-2.96, -0.96]$

$(-\infty, -1.962]$, 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.