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.

$$-5 - 3x < \frac{-13x - 3}{6} \leq 9 - 3x$$

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

A. $(a, b],$ where $a \in [0.4, 9.4]$ and $b \in [-12.4, -7.4]$

$(5.40, -11.40]$, which is the correct interval but negatives of the actual endpoints.

B. $(-\infty, a] \cup (b, \infty),$ where $a \in [5.4, 9.4]$ and $b \in [-11.4, -9.4]$

$(-\infty, 5.40] \cup (-11.40, \infty)$, 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 $a \in [2.4, 7.4]$ and $b \in [-12.4, -6.4]$

$[5.40, -11.40)$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

D. $(-\infty, a) \cup [b, \infty),$ where $a \in [4.4, 7.4]$ and $b \in [-11.4, -10.4]$

$(-\infty, 5.40) \cup [-11.40, \infty)$, 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 $(-5.40, 11.40]$.

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

$$\frac{6}{3} - \frac{8}{8}x > \frac{-3}{5}x - \frac{9}{6}$$

The solution is $(-\infty, 8.75)$, which is option D.

A. $(a, \infty),$ where $a \in [8.75, 9.75]$

$(8.75, \infty)$, 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. $(a, \infty),$ where $a \in [-8.75, -5.75]$

$(-8.75, \infty)$, 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 $a \in [-10.75, -7.75]$

$(-\infty, -8.75)$, which corresponds to negating the endpoint of the solution.

D. $(-\infty, a)$, where $a \in [6.75, 10.75]$

* $(-\infty, 8.75)$, 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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3. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$7 + 8x > 9x \text{ or } 8 + 4x < 5x$$

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

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-8, -6]$ and $b \in [-8, -4]$

Corresponds to including the endpoints AND negating.

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [3, 8]$ and $b \in [8, 11]$

* Correct option.

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-8, -5]$ and $b \in [-9, -1]$

Corresponds to inverting the inequality and negating the solution.

D. $(-\infty, a] \cup [b, \infty)$, where $a \in [4, 9]$ and $b \in [8, 11]$

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

$$8x + 5 \geq 10x + 3$$

The solution is $(-\infty, 1.0]$, which is option C.

A. $(-\infty, a]$, where $a \in [-2.8, 0.7]$

$(-\infty, -1.0]$, which corresponds to negating the endpoint of the solution.

B. $[a, \infty)$, where $a \in [-0.7, 3.3]$

$[1.0, \infty)$, 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!

C. $(-\infty, a]$, where $a \in [-0.6, 5.4]$

* $(-\infty, 1.0]$, which is the correct option.

D. $[a, \infty)$, where $a \in [-1.6, 0.9]$

$[-1.0, \infty)$, 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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5. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

$$\text{No less than 6 units from the number } -3.$$

The solution is $(-\infty, -9] \cup [3, \infty)$, which is option A.

A. $(-\infty, -9] \cup [3, \infty)$

This describes the values no less than 6 from -3

B. $[-9, 3]$

This describes the values no more than 6 from -3

C. $(-9, 3)$

This describes the values less than 6 from -3

D. $(-\infty, -9) \cup (3, \infty)$

This describes the values more than 6 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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6. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

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

The solution is $(-\infty, 2.778]$, which is option A.

A. $(-\infty, a]$, where $a \in [-1.22, 3.78]$

* $(-\infty, 2.778]$, which is the correct option.

B. $(-\infty, a]$, where $a \in [-4.78, 0.22]$

$(-\infty, -2.778]$, which corresponds to negating the endpoint of the solution.

C. $[a, \infty)$, where $a \in [-3.78, 0.22]$

$[-2.778, \infty)$, 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.

D. $[a, \infty)$, where $a \in [1.78, 5.78]$

$[2.778, \infty)$, 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. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

No less than 9 units from the number 5.

The solution is $(-\infty, -4] \cup [14, \infty)$, which is option D.

A. $(-\infty, -4) \cup (14, \infty)$

This describes the values more than 9 from 5

B. $[-4, 14]$

This describes the values no more than 9 from 5

C. $(-4, 14)$

This describes the values less than 9 from 5

D. $(-\infty, -4] \cup [14, \infty)$

This describes the values no less than 9 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.

$$-7 + 8x < \frac{66x + 4}{8} \leq 3 + 8x$$

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

A. $[a, b)$, where $a \in [29, 34]$ and $b \in [-11, -3]$

$[30.00, -10.00)$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

B. $(-\infty, a] \cup (b, \infty)$, where $a \in [30, 34]$ and $b \in [-12, -8]$

$(-\infty, 30.00] \cup (-10.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

C. $(-\infty, a) \cup [b, \infty)$, where $a \in [29, 32]$ and $b \in [-13, -4]$

$(-\infty, 30.00) \cup [-10.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

D. $(a, b]$, where $a \in [30, 31]$ and $b \in [-12, -7]$

$(30.00, -10.00]$, which is the correct interval but negatives of the actual endpoints.

E. None of the above.

   * This is correct as the answer should be $(-30.00, 10.00]$.

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

$$-5 + 4x > 7x \text{ or } 9 + 9x < 12x$$

The solution is $(-\infty, -1.667)$ or $(3.0, \infty)$, which is option B.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-6, -2]$ and $b \in [-0.33, 2.67]$

   Corresponds to including the endpoints AND negating.

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [-1.67, 2.33]$ and $b \in [2.68, 3.81]$

   * Correct option.

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-4, -2]$ and $b \in [1.04, 2.06]$

   Corresponds to inverting the inequality and negating the solution.

D. $(-\infty, a] \cup [b, \infty)$, where $a \in [-1.67, 0.33]$ and $b \in [2, 6]$

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

$$-9x - 7 > 8x - 10$$

The solution is $(-\infty, 0.176)$, which is option C.

A. (a, ∞), where $a \in [-0.02, 0.51]$

   $(0.176, \infty)$, 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 $a \in [-0.46, 0.14]$

   $(-\infty, -0.176)$, which corresponds to negating the endpoint of the solution.

C. $(-\infty, a)$, where $a \in [0.11, 1.05]$

   * $(-\infty, 0.176)$, which is the correct option.

D. (a, ∞), where $a \in [-0.47, -0.17]$

   $(-0.176, \infty)$, 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.