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.

$$\frac{3}{2} + \frac{3}{9}x > \frac{8}{7}x - \frac{5}{3}$$

The solution is $(-\infty, 3.912)$

A. $(-\infty, a)$, where $a \in [2, 7]$

* $(-\infty, 3.912)$, which is the correct option.

B. $(-\infty, a)$, where $a \in [-5, -3]$

$(-\infty, -3.912)$, which corresponds to negating the endpoint of the solution.

C. (a, ∞), where $a \in [-5, -1]$

$(-3.912, \infty)$, 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, ∞), where $a \in [0, 4]$

$(3.912, \infty)$, 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: General Comments: 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.

$$-7 - 4x \leq \frac{-23x + 9}{7} < -8 - 7x$$

The solution is None of the above.

A. $[a, b)$, where $a \in [11, 14]$ and $b \in [0, 5]$

$[11.60, 2.50)$, which is the correct interval but negatives of the actual endpoints.

B. $(-\infty, a) \cup [b, \infty)$, where $a \in [9, 14]$ and $b \in [-2, 5]$

$(-\infty, 11.60) \cup [2.50, \infty)$, 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 $a \in [9, 19]$ and $b \in [2, 6]$

$(-\infty, 11.60] \cup (2.50, \infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

D. $(a, b]$, where $a \in [10, 13]$ and $b \in [2, 4]$

$(11.60, 2.50]$, 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 $[-11.60, -2.50)$.

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.

$$-5 + 9x > 10x \text{ or } -8 + 3x < 6x$$

The solution is $(-\infty, -5.0)$ or $(-2.667, \infty)$

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [0, 6]$ and $b \in [2, 9]$

Corresponds to including the endpoints AND negating.

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [-8, -3]$ and $b \in [-5, 0]$

* Correct option.

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [1, 4]$ and $b \in [0, 8]$

Corresponds to inverting the inequality and negating the solution.

D. $(-\infty, a] \cup [b, \infty)$, where $a \in [-7, -3]$ and $b \in [-4, 1]$

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: General Comments: 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.

$$-10x - 3 \leq -8x - 5$$

The solution is $[1.0, \infty)$

A. $[a, \infty)$, where $a \in [-3.1, -0.8]$

$[-1.0, \infty)$, which corresponds to negating the endpoint of the solution.

B. $(-\infty, a]$, where $a \in [-0.3, 2.5]$

$(-\infty, 1.0]$, 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. $(-\infty, a]$, where $a \in [-1.4, -0.6]$

$(-\infty, -1.0]$, 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.

D. $[a, \infty)$, where $a \in [0.4, 3]$

* $[1.0, \infty)$, 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: General Comments: 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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0. 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 1.

The solution is None of the above

A. $(9, 11)$

This describes the values less than 1 from 10

B. $(-\infty, 9] \cup [11, \infty)$

This describes the values no less than 1 from 10

C. $(-\infty, 9) \cup (11, \infty)$

This describes the values more than 1 from 10

D. $[9, 11]$

This describes the values no more than 1 from 10

E. None of the above

Options A-D described the values [more/less than] 1 units from 10, which is the reverse of what the question asked.

General Comment: General Comments: When thinking about this language, it helps to draw a number line and try points.
