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.

$$3x - 6 > 5x + 6$$

The solution is $(-\infty, -6.0)$

A. (a, ∞), where $a \in [3, 8]$

$(6.0, \infty)$, 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.

B. (a, ∞), where $a \in [-10, 0]$

$(-6.0, \infty)$, 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 $a \in [3, 8]$

$(-\infty, 6.0)$, which corresponds to negating the endpoint of the solution.

D. $(-\infty, a)$, where $a \in [-7, -5]$

* $(-\infty, -6.0)$, 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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2. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{-6}{3} - \frac{9}{6}x < \frac{-8}{9}x - \frac{7}{8}$$

The solution is $(-1.841, \infty)$

A. (a, ∞), where $a \in [-3.3, -1.1]$

* $(-1.841, \infty)$, which is the correct option.

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

$(-\infty, 1.841)$, 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 $a \in [1.1, 3.6]$

$(1.841, \infty)$, which corresponds to negating the endpoint of the solution.

D. $(-\infty, a)$, where $a \in [-5, 0]$

$(-\infty, -1.841)$, 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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3. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

Less than 6 units from the number 5.

The solution is $(-1, 11)$

A. $(-1, 11)$

This describes the values less than 6 from 5

B. $[-1, 11]$

This describes the values no more than 6 from 5

C. $(-\infty, -1) \cup (11, \infty)$

This describes the values more than 6 from 5

D. $(-\infty, -1] \cup [11, \infty)$

This describes the values no less than 6 from 5

E. None of the above

You likely thought the values in the interval were not correct.

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

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

$$-9 + 9x < \frac{59x - 4}{6} \leq 9 + 6x$$

The solution is None of the above.

A. $(-\infty, a] \cup (b, \infty)$, where $a \in [7, 14]$ and $b \in [-4, 1]$

$(-\infty, 10.00] \cup (-2.52, \infty)$, 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 $a \in [6, 11]$ and $b \in [-4, 0]$

$(-\infty, 10.00) \cup [-2.52, \infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

C. $(a, b]$, where $a \in [9, 16]$ and $b \in [-4, 0]$

$(10.00, -2.52]$, which is the correct interval but negatives of the actual endpoints.

D. $[a, b)$, where $a \in [5, 12]$ and $b \in [-5, -1]$

$[10.00, -2.52)$, 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 $(-10.00, 2.52]$.

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

$$-5 + 6x > 7x \text{ or } 9 + 8x < 11x$$

The solution is $(-\infty, -5.0)$ or $(3.0, \infty)$

A. $(-\infty, a) \cup (b, \infty)$, where $a \in [-3.1, -2.5]$ and $b \in [3.9, 5.2]$

Corresponds to inverting the inequality and negating the solution.

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [-5.2, -3.4]$ and $b \in [2.1, 3.8]$

* Correct option.

C. $(-\infty, a] \cup [b, \infty)$, where $a \in [-5.4, -4.1]$ and $b \in [1.6, 4]$

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

D. $(-\infty, a] \cup [b, \infty)$, where $a \in [-3.8, -1]$ and $b \in [3.7, 5.7]$

Corresponds to including the endpoints AND negating.

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.
