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.

---

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

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

The solution is $(-\infty,-2.0)$ or $(1.0,\infty)$

A. $(-\infty,a)\cup(b,\infty)$, where $a\in[-1.31,-0.19]$ and $b\in[1.84,2.65]$

Corresponds to inverting the inequality and negating the solution.

B. $(-\infty,a]\cup[b,\infty)$, where $a\in[-2.3,-1.1]$ and $b\in[-0.43,1.35]$

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

C. $(-\infty,a)\cup(b,\infty)$, where $a\in[-2.4,-1.81]$ and $b\in[0.59,1.56]$

* Correct option.

D. $(-\infty,a]\cup[b,\infty)$, where $a\in[-1.8,-0.2]$ and $b\in[1.13,3.55]$

Corresponds to including the endpoints AND negating.

E. $(-\infty,\infty)$

Corresponds to the variable canceling, which does not happen in this instance.

General Comments: When multiplying or dividing by a negative, flip the sign.

---

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

$$\frac{7}{3}+\frac{3}{2}x<\frac{5}{6}x-\frac{8}{4}$$

The solution is $(-\infty,-6.5)$

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

* $(-\infty,-6.5)$, which is the correct option.

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

$(-\infty,6.5)$, which corresponds to negating the endpoint of the solution.

C. (a,∞), where $a\in[4,9]$

$(6.5,\infty)$, 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 $a\in[-8,-4]$

$(-6.5,\infty)$, 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 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.

---

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

$$-4 + 4x < \frac{30x - 8}{7} \leq -9 + 3x$$

The solution is None of the above.

A. $(-\infty, a) \cup [b, \infty)$, where $a \in [5, 11]$ and $b \in [1, 8]$

$(-\infty, 10.00) \cup [6.11, \infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

B. $(-\infty, a] \cup (b, \infty)$, where $a \in [9, 11]$ and $b \in [1, 7]$

$(-\infty, 10.00] \cup (6.11, \infty)$, 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 $a \in [9, 14]$ and $b \in [5, 7]$

$[10.00, 6.11)$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

D. $(a, b]$, where $a \in [8, 11]$ and $b \in [0, 13]$

$(10.00, 6.11]$, which is the correct interval but negatives of the actual endpoints.

E. None of the above.

* This is correct as the answer should be $(-10.00, -6.11]$.

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.

---

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

More than 8 units from the number 4.

The solution is $(-\infty, -4) \cup (12, \infty)$

A. $[-4, 12]$

This describes the values no more than 8 from 4

B. $(-4, 12)$

This describes the values less than 8 from 4

C. $(-\infty, -4) \cup (12, \infty)$

This describes the values more than 8 from 4

D. $(-\infty, -4] \cup [12, \infty)$

This describes the values no less than 8 from 4

E. None of the above

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

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

---

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

$$-8x + 5 < 7x + 6$$

The solution is $(-0.067, \infty)$

A. (a, ∞), where $a \in [-0.05, 0.35]$

   $(0.067, \infty)$, which corresponds to negating the endpoint of the solution.

B. (a, ∞), where $a \in [-0.1, -0]$

   * $(-0.067, \infty)$, which is the correct option.

C. $(-\infty, a)$, where $a \in [0.02, 0.08]$

   $(-\infty, 0.067)$, 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. $(-\infty, a)$, where $a \in [-0.17, -0.06]$

   $(-\infty, -0.067)$, 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 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.
