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.

---

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

$$-5 - 5x \leq \frac{-16x - 3}{6} < 8 - 3x$$

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

A. $[a, b),$ where $a \in [0.75, 3]$ and $b \in [-26.25, -21.75]$

$[1.93, -25.50)$, which is the correct interval but negatives of the actual endpoints.

B. $(a, b],$ where $a \in [-0.75, 3]$ and $b \in [-26.25, -24]$

$(1.93, -25.50]$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

C. $(-\infty, a) \cup [b, \infty),$ where $a \in [-0.75, 4.5]$ and $b \in [-27.75, -20.25]$

$(-\infty, 1.93) \cup [-25.50, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

D. $(-\infty, a] \cup (b, \infty),$ where $a \in [0, 6.75]$ and $b \in [-30.75, -15.75]$

$(-\infty, 1.93] \cup (-25.50, \infty)$, 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 $[-1.93, 25.50)$.

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.

---

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

No more than 4 units from the number 7.

The solution is $[3, 11]$, which is option B.

A. $(-\infty, 3) \cup (11, \infty)$

This describes the values more than 4 from 7

B. $[3, 11]$

This describes the values no more than 4 from 7

C. $(3, 11)$

This describes the values less than 4 from 7

D. $(-\infty, 3] \cup [11, \infty)$

This describes the values no less than 4 from 7

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.

---

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

$$\frac{6}{3} + \frac{7}{7}x \leq \frac{10}{5}x + \frac{8}{9}$$

The solution is $[1.111, \infty)$, which is option A.

A. $[a, \infty)$, where $a \in [0.38, 1.35]$

* $[1.111, \infty)$, which is the correct option.

B. $[a, \infty)$, where $a \in [-1.72, 0.9]$

$[-1.111, \infty)$, which corresponds to negating the endpoint of the solution.

C. $(-\infty, a]$, where $a \in [0.45, 1.65]$

$(-\infty, 1.111]$, 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 $a \in [-2.17, -0.3]$

$(-\infty, -1.111]$, 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.

---

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

$$3 + 6x \leq \frac{23x - 7}{3} < 6 + 7x$$

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

A. $(-\infty, a] \cup (b, \infty)$, where $a \in [-5.25, -1.5]$ and $b \in [-16.5, -11.25]$

$(-\infty, -3.20] \cup (-12.50, \infty)$, 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 $a \in [-5.25, -0.75]$ and $b \in [-13.5, -11.25]$

$(-\infty, -3.20) \cup [-12.50, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

C. $(a, b]$, where $a \in [-7.5, -2.25]$ and $b \in [-14.25, -10.5]$

$(-3.20, -12.50]$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

D. $[a, b)$, where $a \in [-4.5, -1.5]$ and $b \in [-16.5, -9.75]$

$[-3.20, -12.50)$, which is the correct interval but negatives of the actual endpoints.

E. None of the above.

* This is correct as the answer should be $[3.20, 12.50)$.

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.

---

5. 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 9.

The solution is $(3, 15)$, which is option B.

A. $(-\infty, 3] \cup [15, \infty)$

This describes the values no less than 6 from 9

B. $(3, 15)$

This describes the values less than 6 from 9

C. $(-\infty, 3) \cup (15, \infty)$

This describes the values more than 6 from 9

D. $[3, 15]$

This describes the values no more than 6 from 9

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.

---

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

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

The solution is $(-\infty, -8.0)$ or $(3.5, \infty)$, which is option B.

A. $(-\infty, a) \cup (b, \infty)$, where $a \in [-6, 0]$ and $b \in [6, 9.75]$

Corresponds to inverting the inequality and negating the solution.

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [-18.75, -4.5]$ and $b \in [1.5, 4.5]$

* Correct option.

C. $(-\infty, a] \cup [b, \infty)$, where $a \in [-10.5, -6]$ and $b \in [2.25, 3.75]$

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

D. $(-\infty, a] \cup [b, \infty)$, where $a \in [-5.25, 0.75]$ and $b \in [6, 12]$

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.

---

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

$$-7 + 7x > 8x \text{ or } -4 + 3x < 5x$$

The solution is $(-\infty, -7.0)$ or $(-2.0, \infty)$, which is option D.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-12, -3.75]$ and $b \in [-5.25, -0.75]$

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

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [-2.25, 6.75]$ and $b \in [1.5, 9]$

Corresponds to inverting the inequality and negating the solution.

C. $(-\infty, a] \cup [b, \infty)$, where $a \in [-2.25, 3]$ and $b \in [4.5, 8.25]$

Corresponds to including the endpoints AND negating.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [-9.75, -5.25]$ and $b \in [-4.5, 0.75]$

* Correct option.

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.

---

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

$$-10x - 3 > -8x + 7$$

The solution is $(-\infty, -5.0)$, which is option D.

A. (a, ∞), where $a \in [5, 17]$

$(5.0, \infty)$, 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 $a \in [-5, 0]$

$(-5.0, \infty)$, 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 $a \in [4, 11]$

$(-\infty, 5.0)$, which corresponds to negating the endpoint of the solution.

D. $(-\infty, a)$, where $a \in [-7, 0]$

* $(-\infty, -5.0)$, 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: 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.

---

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

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

The solution is $(-\infty, -1.097]$, which is option B.

A. $[a, \infty)$, where $a \in [-1.5, 0]$

$[-1.097, \infty)$, 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 $a \in [-3, 0]$

* $(-\infty, -1.097]$, which is the correct option.

C. $(-\infty, a]$, where $a \in [-0.75, 3]$

$(-\infty, 1.097]$, which corresponds to negating the endpoint of the solution.

D. $[a, \infty)$, where $a \in [-0.75, 1.5]$

$[1.097, \infty)$, 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.

---

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

$$-10x - 8 < -5x - 4$$

The solution is $(-0.8, \infty)$, which is option D.

A. $(-\infty, a)$, where $a \in [-0.2, 2.8]$

$(-\infty, 0.8)$, 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. $(-\infty, a)$, where $a \in [-1.8, 0.2]$

$(-\infty, -0.8)$, 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, ∞), where $a \in [0.2, 1.6]$

$(0.8, \infty)$, which corresponds to negating the endpoint of the solution.

D. (a, ∞), where $a \in [-2.2, -0.1]$

* $(-0.8, \infty)$, 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: 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.