This is the Answer Key for Module 3 Version C.

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

No more than 3 units from the number 1.

The solution is $[-2, 4]$

A. $[2, 4]$

Corresponds to flipping which number is the 'center' and how far away we are counting from the center number.

B. $[-2, 4]$

* Correct option.

C. $(-2, 4)$

Corresponds to not including the endpoints.

D. $(2, 4)$

Corresponds to flipping the numbers AND not including the endpoints.

General Comments: No more than translates to within. So, we are looking for all the numbers within a certain number.

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

$$6 - 8x \leq -6x + 3$$

The solution is $[1.5, \infty)$

A. $[a, \infty)$, where $a \in [-1, 8]$

* Correct option.

B. $(-\infty, a]$, where $a \in [-1.4, 2.3]$

Corresponds to inverting the inequality AND the negative of the actual solution.

C. $(-\infty, a]$, where $a \in [-4, 1]$

Corresponds to inverting the inequality (wrong direction).

D. $[a, \infty)$, where $a \in [-4.7, -0.2]$

Corresponds to the negative of the actual solution.

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

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

General Comments: Remember that less than or equal to includes the endpoint!

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

$$\frac{3}{8} + \frac{6}{5}x > \frac{10}{6}x - \frac{10}{7}$$

The solution is $(-\infty, 3.865)$

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

* Correct option.

B. (a, ∞), where $a \in [-5, -2]$

Corresponds to inverting the inequality AND getting the negative of the solution.

C. $(-\infty, a)$, where $a \in [-4, -1]$

Corresponds to getting the negative of the solution.

D. (a, ∞), where $a \in [1, 6]$

Corresponds to inverting the inequality.

E. There is no solution to the inequality.

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

General Comments: Remember that less than or equal to includes the endpoint. Also, when multiplying or dividing by a negative, flip the sign.

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

$$-4 + 6x > 8x \text{ or } 7 + 9x < 10x$$

The solution is $(-\infty, -2.0)$ or $(7.0, \infty)$

A. $(-\infty, a) \cup (b, \infty)$, where $a \in [-9, -5]$ and $b \in [-4, 5]$

Corresponds to inverting the inequality and negating the solution.

B. $(-\infty, a] \cup [b, \infty)$, where $a \in [-6, 0]$ and $b \in [4, 9]$

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

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-5, 4]$ and $b \in [5, 9]$

* Correct option.

D. $(-\infty, a] \cup [b, \infty)$, where $a \in [-11, -5]$ and $b \in [1, 6]$

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.

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

$$-6 - 5x < \frac{-18x + 7}{4} \leq -5 - 6x$$

The solution is $(-15.5, -4.5]$

A. $[a, b)$, where $a \in [-16, -15]$ and $b \in [-8, -4]$

Corresponds to including the endpoints.

B. $(a, b]$, where $a \in [2, 8]$ and $b \in [8, 19]$

Corresponds to negating and inverting the inequality.

C. $(a, b]$, where $a \in [-17, -13]$ and $b \in [-7, -3]$

* This is the correct solution.

D. $[a, b)$, where $a \in [2, 5]$ and $b \in [15, 18]$

Corresponds to including the endpoints AND inverting the inequality.

E. There is no solution to the inequality.

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

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.