

Module 7: Solving Linear Inequalities

Topic 1: Examples of the Properties of Inequality

Introduction

EXAMPLES OF THE PROPERTIES OF INEQUALITY

Click the Examples Below to Learn More

Example One

Example Three

Example Two

Self-Check

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EDUCATION

Click the examples below to learn more.

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Example 1

Apply the Transitive Property of Inequality to complete the following statement.

If $5x < 3y$ and $3y < 10x$, then $5x < ?$

The Transitive Property of Inequality states that, If $a < b$ and $b < c$, then $a < c$.

In the given inequalities:

let a represent $5x$,

let b represent $3y$, and

let c represent $10x$.

Now, if $5x < 3y$ and $3y < 10x$, then $5x < ?$

By following the pattern given by the Transitive Property of Inequality, the right side of the final inequality has a value of $10x$.

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Example 2

Which property justifies the work between Steps 1 and Step 2?

Step 1: $x - 4 > 10$

Step 2: $x - 4 + 4 > 10 + 4$

Step 3: $x > 14$

Notice that four was added to both sides of the inequality given in step one in order to arrive at the inequality in step two. The addition property of inequality states that if the same value is added to both sides of the inequality, the inequality will remain true. Therefore, the addition property of inequality justifies the work between step one and step

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Example 3

Step 1: $3x + 9 \leq 15$

Step 2: $3x + 9 - 9 \leq 15 - 9$

Step 3: $3x \leq 6$

Step 4: $\frac{3x}{3} \leq \frac{6}{3}$

Step 5: $x \leq 2$

Which property justifies the work between Steps 1 and Step 2?


Notice that nine was subtracted from both sides of the inequality given in step one in order to arrive at the inequality in step two. The subtraction property of inequality states that if the same value is added to both sides of the inequality, the inequality will remain true. Therefore, the subtraction property of inequality justifies the work between step one and step two.

Which property validates the work between Steps 3 and Step 4?

Notice that both sides of the inequality given in step three were divided by three in order to arrive at the inequality given in step four. The division property of inequality states that if both sides of an inequality are divided by the same value, that is greater than zero,

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Self-Check 1

 Self-Check The Addition Property of Inequality justifies the work between which two consecutive steps? <ul style="list-style-type: none">● Step 2 and Step 3● Step 1 and Step 2● Step 4 and Step 5● This property is not used <th data-bbox="808 226 1432 850">Example</th>	Example
SUBMIT	Step 1: $4(x-2) \geq 12$ Step 2: $4x-8 \geq 12$ Step 3: $4x-8+8 \geq 12+8$ Step 4: $4x \geq 20$ Step 5: $\frac{4x}{4} \geq \frac{20}{4}$ Step 6: $x \geq 5$

Solve the problem in the image above to check your understanding of the content.

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Self-Check 1: Answer

The screenshot shows a digital interface for a self-check. On the left, a dark grey sidebar contains a red checkmark icon and the text "Self-Check". Below this, a vertical list of radio buttons is partially visible, with the first one selected. The main content area is split into two sections: "Self-Check" (dark grey) and "Example" (teal). A large white box with rounded corners is centered over the interface, containing the following text and equations:

Correct
That's correct! 8 is added to both sides of the inequality in Step 2 in order to arrive at the inequality in Step 3. **Step 2 and Step 3** are an example of the Addition Property of Inequality.


Step 1: $4(x-2) \geq 12$
Step 2: $4x - 8 \geq 12$
Step 3: $4x - 8 + 8 \geq 12 + 8$ + 8
Step 4: $4x \geq 20$
Step 5: $\frac{4x}{4} \geq \frac{20}{4}$
Step 6: $x \geq 5$

At the bottom of the white box is a "Continue" button. Below the white box, a pink bar contains the word "SUBMIT".

For your reference, the image above shows the correct solution to the self-check problem.

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Self-Check 2

 Self-Check The Division Property of Inequality justifies the work between which two consecutive steps? <ul style="list-style-type: none">● Step 3 and Step 4● Step 1 and Step 2● Step 4 and Step 5● This property is not used <th data-bbox="812 268 1430 884">Example Step 1: $4(x-2) \geq 12$ Step 2: $4x-8 \geq 12$ Step 3: $4x-8+8 \geq 12+8$ Step 4: $4x \geq 20$ Step 5: $\frac{4x}{4} \geq \frac{20}{4}$ Step 6: $x \geq 5$</th>	Example Step 1: $4(x-2) \geq 12$ Step 2: $4x-8 \geq 12$ Step 3: $4x-8+8 \geq 12+8$ Step 4: $4x \geq 20$ Step 5: $\frac{4x}{4} \geq \frac{20}{4}$ Step 6: $x \geq 5$
SUBMIT	

Solve the problem in the image above to check your understanding of the content.

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Self-Check 2: Answer

The screenshot shows a digital interface for a self-check. On the left, a dark grey sidebar contains a red checkmark icon and the text "Self-Check". Below this, a vertical list of radio buttons is partially visible, with the text "The just cons" above them. The main content area is split into two sections: "Self-Check" (dark grey) and "Example" (teal). A large white box with rounded corners is centered over the "Self-Check" section. Inside this box, the word "Correct" is written in bold. Below it, a paragraph of text explains the solution process. To the right of the text, six steps of the solution are listed, each with a corresponding equation. A large "+ 8" is positioned to the right of the equations for Step 3 and Step 4. At the bottom of the white box is a "Continue" button. Below the white box, a pink bar contains the word "SUBMIT" in white capital letters. The teal "Example" section is visible on the right side of the interface.

Correct

That's correct! Both sides of the inequality in Step 4 are divided by 4, in order to arrive at the inequality in Step 5. **Step 4 and Step 5** are an example of the Division Property of Inequality.

Step 1: $4(x-2) \geq 12$

Step 2: $4x-8 \geq 12$

Step 3: $4x-8+8 \geq 12+8$

Step 4: $4x \geq 20$

Step 5: $\frac{4x}{4} \geq \frac{20}{4}$

Step 6: $x \geq 5$

Continue

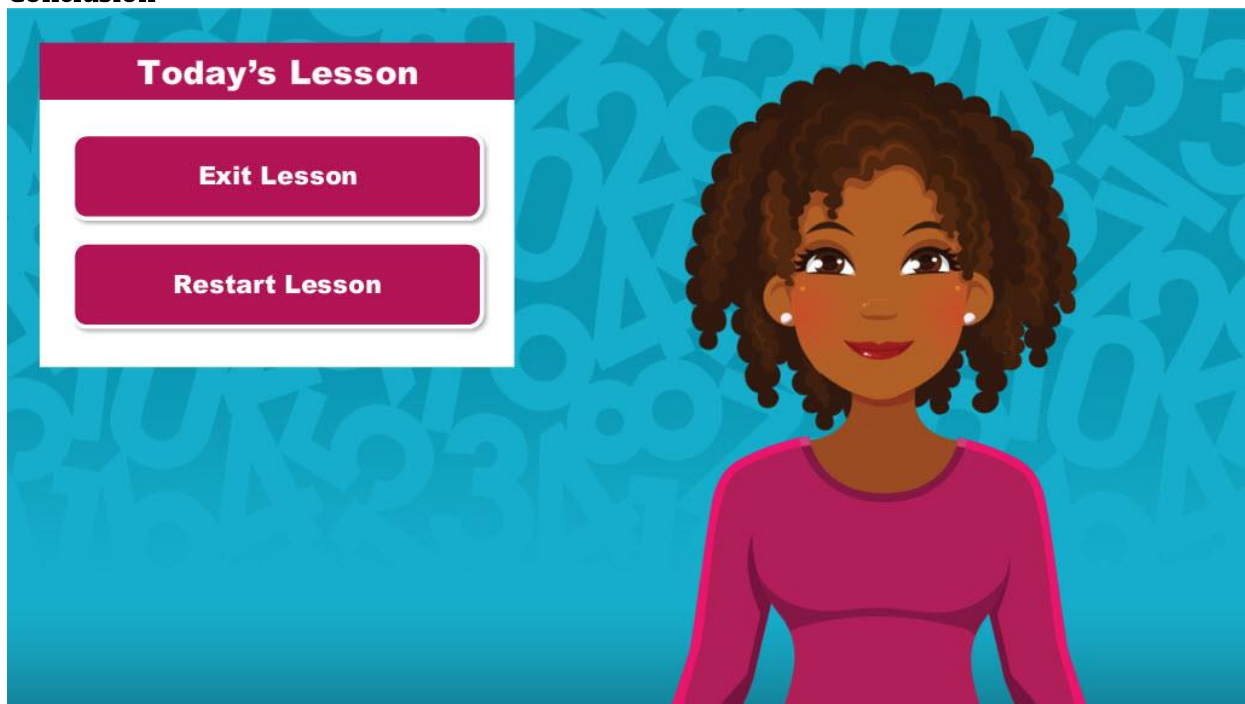
SUBMIT

For your reference, the image above shows the correct solution to the self-check problem.

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Conclusion



Today's Lesson: Exit Lesson or Restart Lesson