

Just In Time Quick Check
Standard of Learning (SOL) 8.18

Strand: Patterns, Functions, and Algebra

Standard of Learning (SOL) 8.18

The student will solve multistep linear inequalities in one variable with the variable on one or both sides of the inequality symbol, including practical problems, and graph the solution on a number line.

Grade Level Skills:

- Apply properties of real numbers and properties of inequality to solve multistep linear inequalities (up to four steps) in one variable with the variable on one or both sides of the inequality. Coefficients and numeric terms will be rational. Inequalities may contain expressions that need to be expanded (using the distributive property) or require collecting like terms to solve.
- Graph solutions to multistep linear inequalities on a number line.
- Write verbal expressions and sentences as algebraic expressions and inequalities.
- Write algebraic expressions and inequalities as verbal expressions and sentences.
- Solve practical problems that require the solution of a multistep linear inequality in one variable.
- Identify a numerical value(s) that is part of the solution set of a given inequality.

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting Resources:

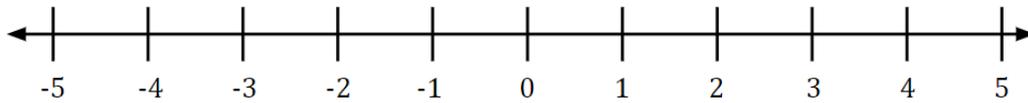
- VDOE Mathematics Instructional Plans (MIPS)
 - [8.18 - Solve Multistep Inequalities and Graph the Solution](#) (Word) / [PDF Version](#)
- VDOE Algebra Readiness Formative Assessments
 - [SOL 8.18](#) (Word) / [PDF](#)
- VDOE Algebra Readiness Remediation Plans
 - [Solving and Graphing Practical Situations](#) (Word) / [PDF](#)
- VDOE Word Wall Cards: Grade 8 ([Word](#)) | ([PDF](#))
 - Term
 - Constant
 - Like Terms
 - Inequality

Supporting and Prerequisite SOL: [8.14a](#), [8.14b](#), [8.17](#), [7.13](#), [6.14a](#), [6.14b](#)

SOL 8.18 - Just in Time Quick Check

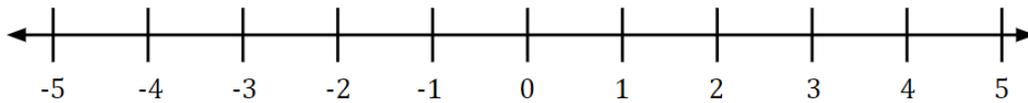
- 1) Solve the inequality and graph the solution set on the number line.

$$-6.5x + 3 < 19 - 2.5x$$



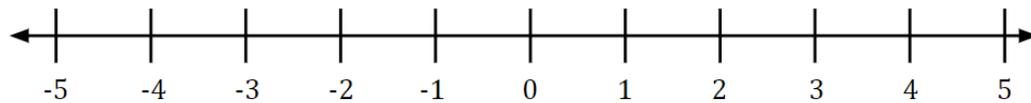
- 2) Solve the inequality and graph the solution set on the number line.

$$5x - (x - 2) > 14$$



- 3) Solve the inequality and graph the solution set on the number line.

$$22 \geq 5(x - 2) + 3x$$



- 4) Identify each value of x that makes $10x - 8 > 2(4x + 2)$ true.



5) Write an algebraic inequality statement from the verbal sentence shown.

The product of negative five and a number is greater than twice the sum of the same number and three.

6) The Valley High Marching Band is selling candy bars for a fundraiser.

- Sierra sold some candy bars.
- Breanna sold twice as many candy bars as Sierra.
- Together Sierra and Breanna sold no less than 45 candy bars.

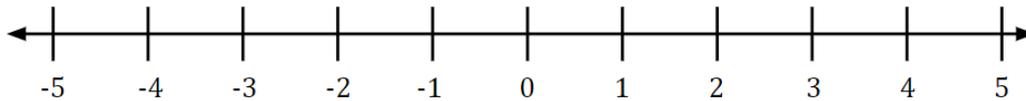
Write an inequality to represent this situation. Give three possible solutions for how many candy bars Sierra sold.

SOL 8.18 - Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

- 1) Solve the inequality and graph the solution set on the number line.

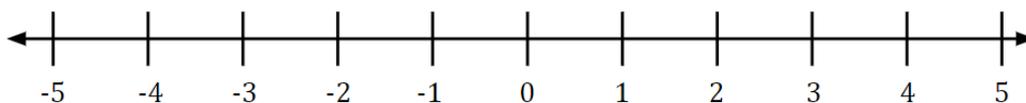
$$-6.5x + 3 < 19 - 2.5x$$



A common error students may make is failing to reverse the inequality symbol, resulting in a solution of $x < -4$. This may indicate the student does not understand that when both sides of an inequality are divided or multiplied by a negative number, the inequality symbol must be reversed. These students may benefit from exploring a numerical inequality, such as $4 < 8$ and exploring what happens to this relationship as negative numbers are added, subtracted, multiplied, and divided to both the 4 and the 8. Refer to the [MIP Two Step Inequality Practical Problems](#) for an example of this.

- 2) Solve the inequality and graph the solution set on the number line.

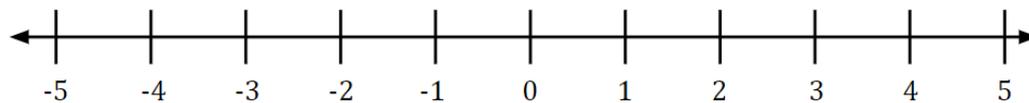
$$5x - (x - 2) > 14$$



A common error a student may make is not distributing the negative sign to both terms in the expression, $(x - 2)$, resulting in a simplified statement of $x > 4$. This may indicate that a student does not have a conceptual understanding that -1 is being multiplied to both terms of the expression $(x - 2)$. A student could benefit from additional practice simplifying expressions involving the Distributive Property (SOL 8.14b).

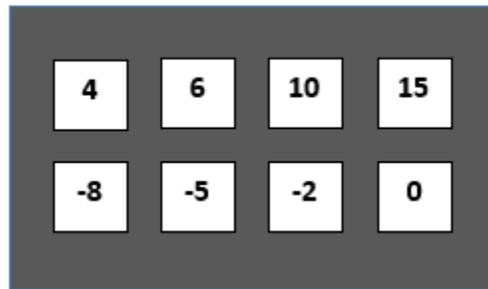
- 3) Solve the inequality and graph the solution set on the number line.

$$22 \geq 5(x - 2) + 3x$$



A common error students may make is graphing the simplified inequality of $4 \geq x$ in the wrong direction. This may indicate that students do not understand how to write an equivalent inequality statement with the variable on the left side of the inequality symbol. These students may benefit from writing inequalities in two different ways when presented with a graph of a solution set (e.g. $2 < x$ and $x > 2$). These students could benefit from recognizing that the original statement can be written as an equivalent statement with the variables on the left side before simplifying. In addition, students could benefit from more experiences graphing inequalities when the variable is on the right side of the inequality symbol.

- 4) Identify each value of x that makes $10x - 8 > 2(4x + 2)$ true.



A common error a student may make is to identify the value of 6 as part of the solution set of the simplified statement, $x > 6$. This may indicate that a student does not understand that greater than does not include the boundary point as part of the solution. A student may benefit from graphing the solution set before selecting answers. In addition, a student may benefit from frequent class discussions about possible solutions to inequalities and whether a boundary point should be considered as part of the solution set.

- 5) Write an algebraic inequality statement from the verbal sentence shown.

The product of negative five and a number is greater than twice the sum of the same number and three.

A common error a student may make is to write the right side of the inequality statement as $2x + 3$. This may indicate that a student does not recognize the meaning that twice the sum of the same number and three implies the use of the distributive property. A student may benefit from additional practice with translating verbal sentences into algebraic statements where the distributive property is a focus. A teacher may also want to provide students with examples of algebraic expressions, equations, and inequalities involving the distributive property and ask student to write a verbal representation of the algebraic form.

- 6) The Valley High Marching Band is selling candy bars for a fundraiser.

- Sierra sold some candy bars.
- Breanna sold twice as many candy bars as Sierra.
- Together Sierra and Breanna sold no less than 45 candy bars.

Write an inequality to represent this situation. Give three possible solutions for how many candy bars Sierra sold.

A common error a student may make is to represent this situation as $x + 2x < 45$. This may indicate that students are interpreting “no less than” as “less than” and using the $<$ symbol. A student may benefit from additional practice translating inequalities where a variety of phrases are used to represent inequality symbols. Refer to [MIP Two Step Inequality Practical Problems](#) for examples of practical situations that can be represented by inequalities.