Unit 03 - Solving Inequalities

Content Area: **Mathematics**
Course(s): **Algebra I**
Time Period: **September**
Length: **15 days**
Status: **Published**

Enduring Understandings

- An equivalent pair of linear equations or inequalities can be used to solve absolute value equations and inequalities.
- An inequality is a mathematical sentence that uses an inequality symbol to compare the values of two expressions.
- Inequalities can be represented with symbols; their solutions can be represented on a number line.
- Just as properties of equality can be used to solve equations, properties of inequality can be used to solve inequalities (including multi-step and compound inequalities)

Essential Questions

- Can inequalities that appear to be different be equivalent?
- How can you solve inequalities?
- How is solving inequalities similar to and different from solving equations?

Standards/Indicators

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.A-SSE.A.1b	Interpret complicated expressions by viewing one or more of their parts as a single entity.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.N-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.
MA.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems.
MA.A-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Student Learning Objectives (SLOs)

- Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, simple rational and exponential functions and highlighting a quantity of interest in a formula.
- Create linear equations and inequalities in one variable and use them to solve problems. Justify each step in the process and the solution.
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- Interpret parts of expressions in terms of context including those that represent square and cube roots; use the structure of an expression to identify ways to rewrite it.
- Solve linear equations and inequalities in one variable (including literal equations). Justify each step in the process and solution.

Lesson Titles

- Absolute Value Equations and Inequalities
- Compound Inequalities
- Inequalities and Their Graphs
- Solving Inequalities using Addition or Subtraction
- Solving Inequalities using Multiplication or Division
- Solving Multi-Step Inequalities
- Unions and Intersection of Sets
- Working with Sets

Career Readiness, Life Literacies & Key Skills

TECH.9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
TECH.9.4.2.CI.2	Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).
TECH.9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
TECH.9.4.2.DC.1	Explain differences between ownership and sharing of information.
TECH.9.4.2.DC.2	Explain the importance of respecting digital content of others.
TECH.9.4.2.DC.3	Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).
TECH.9.4.2.TL.2	Create a document using a word processing application.
TECH.9.4.2.TL.3	Enter information into a spreadsheet and sort the information.

Inter-Disciplinary Connections

LA.RH.9-10.1	Accurately cite strong and thorough textual evidence, to support analysis of primary and secondary sources, attending to such features as the date and origin of the information.
LA.RL.11-12.4	Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on

	meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful. (e.g., Shakespeare as well as other authors.)
LA.RH.9-10.7	Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text, to analyze information presented via different mediums.
LA.W.9-10.2	Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
LA.W.9-10.2.A	Introduce a topic; organize complex ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
LA.W.9-10.6	Use technology, including the Internet, to produce, share, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
9-12.HS-ETS1-4.5	Using Mathematics and Computational Thinking
9-12.HS-PS1-7.5	Mathematical and computational thinking at the 9–12 level builds on K–8 and progresses to using algebraic thinking and analysis, a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms, and computational tools for statistical analysis to analyze, represent, and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions.

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK

- Discussion on vocabulary including and/or and conjunction/disjunction
- Introduction, notes, and examples on solving and graphing inequalities in one variable
- Introduction, notes, and examples on solving word problems with inequalities
- students will work as a team and explain their work
- #1- Blooms Knowledge - Remember previously learned information
- #2 - Blooms Comprehension - Demonstrate an understanding of facts
- #3 - Blooms Application - Apply Knowledge to actual situations
- #4 - Blooms Analysis - Break down objects or ideas into simpler parts and find evidence to support generalizations
- #5 - Blooms Synthesis - Compile component ideas into a new whole or propose alternative solutions
- #6 - Blooms Evaluation - Make and defend judgments based on internal evidence or external criteria
- Introduction, notes, and examples on solving and graphing conjunctions and disjunctions
- Notes and examples on multiplying or dividing by a negative when solving inequalities
- review homework if need - answers posted on Google Classroom
- review warm up
- students will work individually
- tutoring during Delsea One

Modifications

ELL Modifications

- Acquire the help from the Foreign Language Department if possible
- Assess ELL students continuously using formative assessment methods
- Be flexible with time frames and deadlines
- During Delsea One - one on one with a student who speaks the same language
- Intentional scheduling/grouping with student/teacher who speaks the same language if possible
- Offer resources for specific topics in primary language (Youtube web resources)
- Repeat, reword, clarify
- tutoring during Delsea One
- Use google translator, especially for application problems
- Using technology, such as but not limited to: graphing calculator and desmos

IEP & 504 Modifications

- Allow re-takes only after a tutoring session
- Assessments will allow for calculator use and/or other math tools
- Give assessments on mathxl that are from the interactive algebra 1; however, the homework/classwork on mathxl will be from algebra 1 to expose them to the material
- Give some worksheets on solving one step and two step equations to get stronger
- Higher level reasoning questions would have less weight than other questions or provide as extra credit questions to provide exposure to these questions but not something that will be a determinant to the student's ability to share knowledge of content
- if not in a co-teaching setting allowing time in the schedule for a special education teacher to consult with general education teachers on what specifically can be modified or how to paraphrase things in a different way specific to that lesson
- Keep updated videos on google classroom for reinforcement outside of the classroom
- Less questions overall or possibly break the test into two parts
- Modeling and showing several examples
- Show solving an inequality that includes fractions an alternative way to solve instead of reciprocating the fraction
- Speaking to students privately when redirecting behaviors
- tutoring during Delsea One
- Use a colored highlighter to highlight the variable that needs to be isolated

G&T Modifications

- Provide more rigorous problems; either off the NJ State website or from the Pearson Algebra 2 textbook (available on mathxl)
- Allow to go ahead on concepts on mathxl
- Ask students' higher level questions that require students to look into causes, experiences, and facts

to draw a conclusion or make connections to other areas of learning

- Employ differentiated curriculum to keep interest high
- Encourage students to make transformations- use a common task or item in a different way
- Flip the lessons to push further ahead
- Flip the lessons using videos of more in depth work
- Include more in depth problems involving application
- Invite students to explore different points of view on a topic of study and compare the two
- tutoring during Delsea One
- Videos that offer extra practice and examples in all areas are posted on google classroom and taken from: mathispower4u

At Risk Modifications

- Refer students to Organizational Management
- Require Delsea One tutoring
- Stay in contact with parents/guardians and guidance counselors on student progress
- tutoring during Delsea One

Formative Assessment

- Connecting previous lessons
- Connecting vocabulary with root words
- Discussion including vocab review/recall
- Evaluate your understanding of the lesson
- Guided review
- Homework/classwork
- Mathxlforschool
- NJSLA Math type of question
- Pass out of class
- SAT question of the day
- Skill need to do lesson
- Teacher Observation
- Think-pair-share
- Turn to your partner and discuss
- Use What You Know - type of question
- Video Clip
- Warm up review
- White Boards

Benchmark Assessments

Skills Based assessment- math practice

Alternate Assessment

Performance tasks

Project-based assignments

Problem-based assignments

Presentations

Summative Assessment

- Benchmark Assessment
- Marking Period Assessment
- Quiz on Solving Absolute Value Equations and Inequalities
- Quiz on Solving Inequalities
- Unit test on Solving Inequalities and Absolute Value

Resources & Materials

- Colored pencil/highlighters
- Google Slides
- Mathispower4u video clip to introduce or demonstrate concepts
- Pearson 2015 Algebra 1 textbook
- Teacher generated worksheets
- White board paddles

Technology

- Chromebooks
- Desmos
- Edpuzzle
- Equatio

- Google Classroom
- Google Forms
- Graphing Calculator
- Mathway
- Mathxlforschool
- PearDeck
- Remind
- Video Clips

TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.12.A.4	Construct a spreadsheet workbook with multiple worksheets, rename tabs to reflect the data on the worksheet, and use mathematical or logical functions, charts and data from all worksheets to convey the results.
TECH.8.1.12.A.CS1	Understand and use technology systems.
TECH.8.1.12.B.CS2	Create original works as a means of personal or group expression.