



Pre-College Algebra & Trigonometry - Unit 2 - Equations and Lines

Unit Focus

In this unit students will understand that the way we solve equations is based on an understanding of the order of operations. There are certain equations that require more than just an algebraic step (absolute value requires a leap of logic). Literal equations are a great opportunity for students to hone their equation solving skills which will be beneficial in other classes, like science.

For writing equations of lines, students should get to the point where they no longer think of every problem as a unique case, but as all being basically the same, just slight variations. Students should appreciate the usefulness of all forms of lines, not just $y = mx + b$, and should be allowed to leave answers in any form. Students should leave the unit displaying confidence in their understanding of how slope can be interpreted in the real world.

Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
Common Core Mathematics: 9-12 - Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (CCSS.MATH.CONTENT.HSN.Q.A.1) - Define appropriate quantities for the purpose of descriptive modeling. (CCSS.MATH.CONTENT.HSN.Q.A.2) - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (CCSS.MATH.CONTENT.HSA.CED.A.2) - Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. (CCSS.MATH.CONTENT.HSA.CED.A.4) - Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. (CCSS.MATH.CONTENT.HSA.REI.A.1) - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. (CCSS.MATH.CONTENT.HSA.REI.B.3) - Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). (CCSS.MATH.CONTENT.HSA.REI.D.10)	<i>Students will be able to independently use their learning to...</i> T1 manipulate equations/expressions or objects to create order and establish relationships. T2 represent and interpret patterns in numbers, data and objects. T3 make sense of a problem, initiate a plan, execute it, and evaluate the reasonableness of the solution.	
	Meaning	
	Understanding(s)	Essential Question(s)
	<i>Students will understand that...</i> U1 mathematicians look for ways to generalize. U2 mathematicians understand that placing a problem in a category gives one a familiar approach to solving it U3 mathematicians use the order of operations to solve equations.	<i>Students will keep considering...</i> Q1 How do I know I've solved the problem right? Q2 How do I interpret a linear model? Q3 What have I seen in the past that might help me now?
	Acquisition of Knowledge and Skill	
	Knowledge	Skill(s)
	<i>Students will know...</i> K1 solving absolute value equations requires logic reasoning and a complete understanding of the definition of absolute value K2 what it means to be a solution to an equation.	<i>Students will be skilled at...</i> S1 solving linear single variable equations and inequalities S2 solving absolute value equations S3 solving literal equations

Stage 1: Desired Results - Key Understandings

- Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
(CCSS.MATH.CONTENT.HSF.LE.A.1.B)
- Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
(CCSS.MATH.CONTENT.HSF.LE.A.2)
- Interpret the parameters in a linear or exponential function in terms of a context. (CCSS.MATH.CONTENT.HSF.LE.B.5)
- Make sense of problems and persevere in solving them.
(CCSS.MATH.MP.1)
- Reason abstractly and quantitatively. (CCSS.MATH.MP.2)
- Model with mathematics. (CCSS.MATH.MP.4)
- Look for and make use of structure. (CCSS.MATH.MP.7)

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- Analyzing: Examining information/data/ evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. (POG.1.2)

K3 a linear model can be used to make predictions.
K4 slope represents a constant rate of change.
K5 the distributive property $a(b + c) = ab + ac$ can be used right to left (factoring)
K6 Vocabulary: linear, literal, rate of change, extraneous solution

S4 writing equations of lines
S5 interpreting linear equations
S6 solving systems (optional)
S7 Using interval notation
S8 Factoring out the GCF to solve an equation