

CC Algebra II - Regents Review

Unit 3: Linear Functions, Equations, and Their Algebra

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Based on Kirk Weiler's
emathinstruction lessons

Unit 3: Video Overview

- ❖ Lesson Overview
- ❖ CCLS Associated with Unit 3
- ❖ Formulas
- ❖ Direct Variation
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- ❖ Forms of a line
- ❖ Solutions to Systems of Equations - Graphically
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- ❖ Piecewise Functions
- ❖ Solving Systems of 3x3 Equations
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Lesson Overview

- 3.1 Direct Variation
- 3.2 Average Rate of Change (F.IF.6)
- 3.3 Forms of a Line (F.LE.2)
- 3.4 Linear Modeling (F.LE.5)
- 3.5 Inverses of Linear Functions (F.BF.4)
- 3.6 Piecewise Linear Functions
- 3.7 Systems of Linear Equations (A.REI.6)

CCLS Associated with Unit 3

- ❖ A.REI.6 - Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. Tasks are limited to 3 by 3 systems.
- ❖ F.IF.6 - Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.
- ❖ F.LE.2 - 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) Tasks will involve solving multi-step problems by constructing linear and exponential functions.
- ❖ F.LE.5 - Interpret the parameters in a linear or exponential function in terms of a context. Tasks are limited to exponential functions with domains not in the integers.
- ❖ F.BF.4 - Find inverse functions.
Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse.

Formulas

- ❖ Direct Variation
- ❖ Average Rate of Change
- ❖ Slope-Intercept form a of Line
- ❖ Point-Slope form of a Line

Direct Variation

- ❖ Examples of Direct Variation

- ❖ Non-Examples of Direct Variation

Rate of Change Formula

- ❖ Evaluating the Rate of Change of a Function

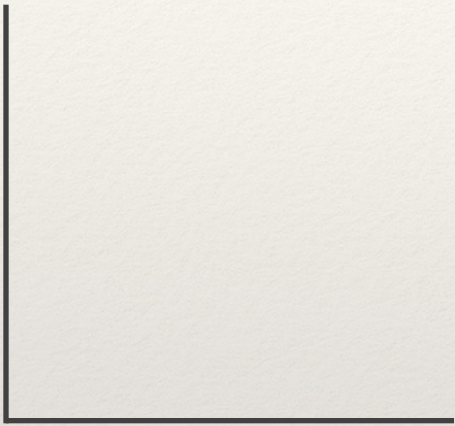
- ❖ Rate of Change of Linear Functions

Forms of a Line

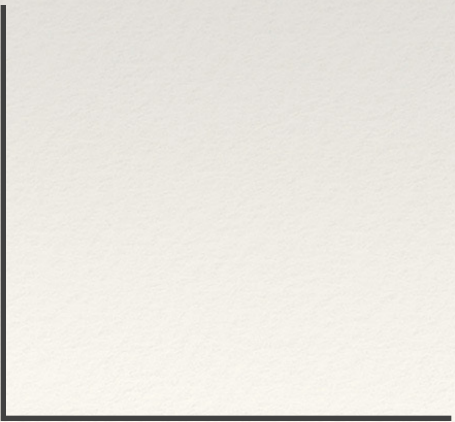
- ❖ Finding Equations of a Line given a point and slope
- ❖ Finding Equations of a Line parallel to a given line
- ❖ Finding Equations of a Line perpendicular to a given line

Solutions to Linear Equations (Graphically)

- ❖ Two intersecting Lines



- ❖ Using the graph to find interval of x -values that produce a range of y -values



Inverses of Linear Functions

- ❖ Switch the x and y variables and solve for y .
- ❖ Cases where the inverse is not a function.
- ❖ Points of the inverse function, given a point on the original function.

Piecewise Functions

Solving Systems of 3x3 Equations

Solve the following system of equations algebraically.

$$3x + y - 2z = 12$$

$$4x - 2y + 3z = -3$$

$$4x - y + z = 3$$

Summary of the Most Important Information

- ❖ Students should be able to:
 - ❖ Find the average rate of change of a function over a given interval of values.
 - ❖ Solve systems of equations graphically.
 - ❖ Algebraically find the inverse of a linear function.
 - ❖ Find a point on the inverse of a function, given a point on the function.
 - ❖ Write the equation of a piece-wise function given its graph, or graph a piece-wise function given its equation.
 - ❖ Solve a system of 3×3 equations algebraically.