Math 0995 CBE 6 Review

UtahStateUniversity

AggieMathLearningCenter

CBE 6

- Covers lessons 33-38
  - Linear Equations and Their Graphs
  - Slope of a Line
  - Determining the Equation for a Line
  - Graphs of Common Functions and Basic Transformations
  - Solving Systems of Equations
  - Using Desmos

Linear Equations

Linear Equations and Their Graphs

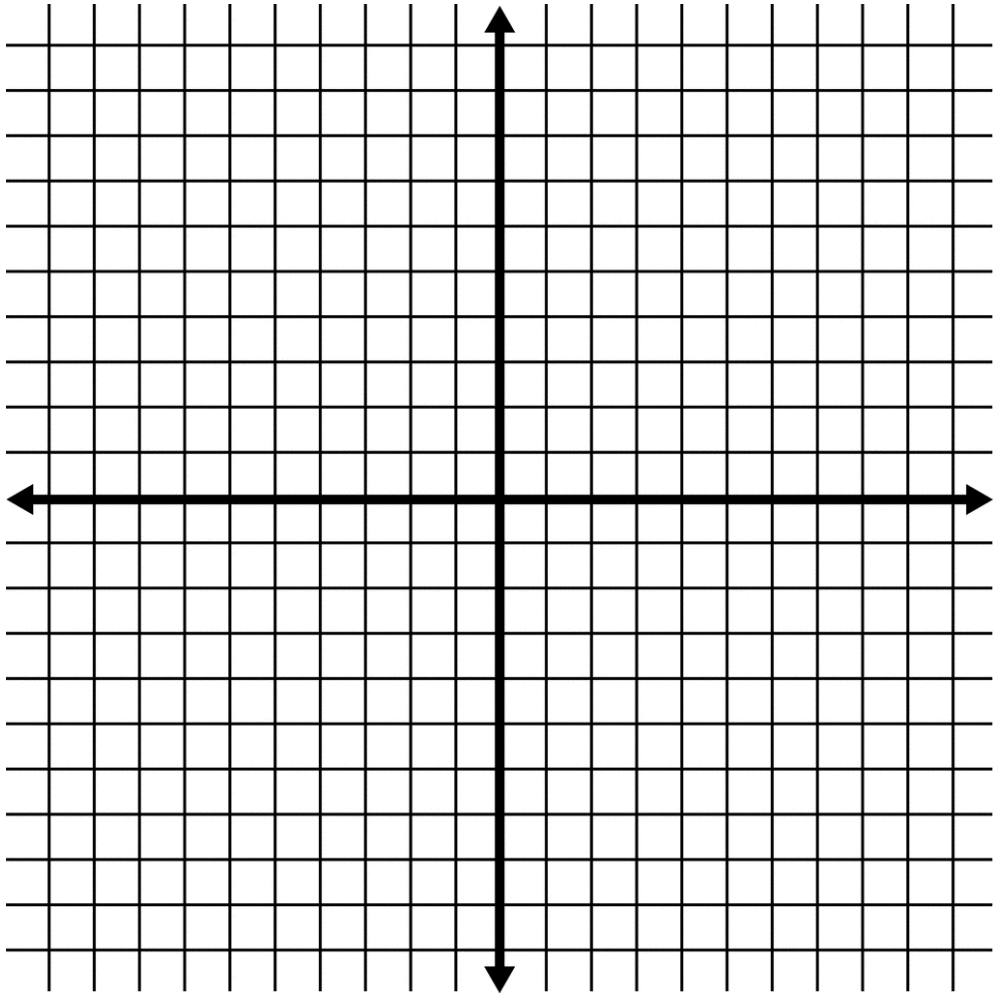
AggieMathLearningCenter

Linear Equations

- Linear equations create a line which represent visually represents all x and y combinations that make the equation true.

Problem 1

- Draw the graph of the linear equation $x + 5y = -10$



Slope of a Line

Slope of a Line

- Think of the slope as a comparison of the change in y to the change in x.
- The equation for the slope is: $\dfrac{y_2 - y_1}{x_2 - x_1}$

Problem 2

- Determine the slope of the line that contains

(1/2, -4) and (2, -5/4)

- Solution: 11/6

Equation of a Line

Determining the Equation of a Line

- To find the equation of a line you need two things: the slope and a point on the line.

- There are many forms for the equation of a line the two most common being:
- Point intercept form: $y = mx + b$
- Standard form : $(y – y1) = m(x – x1)$

Problem 3

- Determine the equation of the line that contains

(3, 6) and (8, 9)

- Solution:

Problem 4

- Determine the equation of the line that contains

(-6, -7) and (-6, 1)

- Solution: x = -6

Problem 5

- Determine the equation of the line that contains (0,3) and is parallel to $9x - 2y = 3$

- Solution:

Problem 6

- Determine the equation of the line that contains (-4, 5) and is perpendicular to the line $4x + 2y = 6$

- Solution:

Transformations

Common Graphs and Transformations

Common Functions

- Linear $y = x$
- Parabola $y = x^2$
- Square Root $y = \sqrt{x}$
- Absolute Value $y = |x|$

Transformations

- Shifting:
  - Horizontal shift: f(x - c) – Shifts the graph horizontally c
  - Vertical Shift: f(x) + c – Shifts the graph vertically c
- Reflection:
  - Across the x-axis: -f(x)

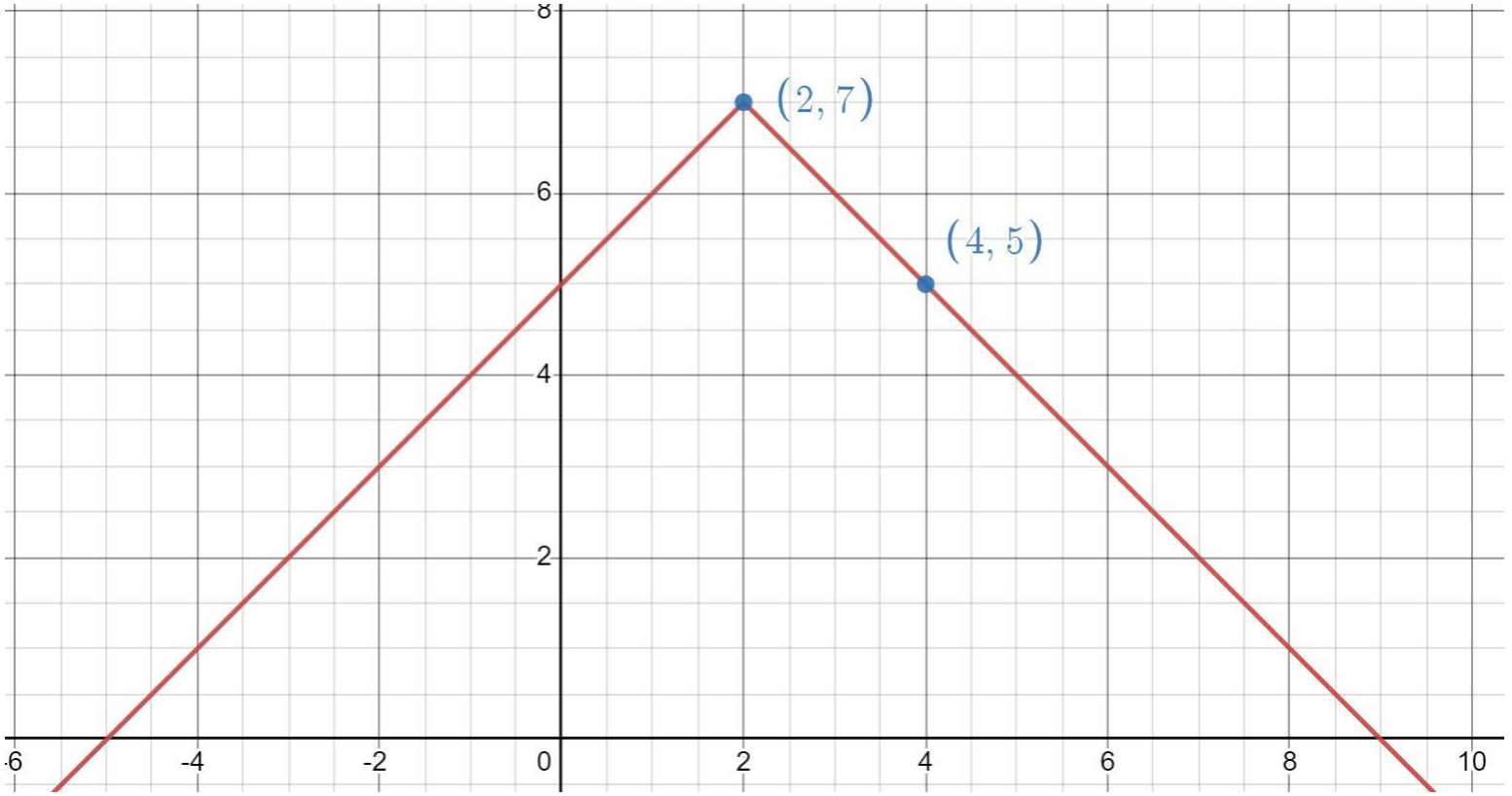
Problem 7

- The graph of the equation $y = \sqrt{x + 72} + 155$ is the same shape as the graph of $y = \sqrt{x}$ with what transformations?

- Solution: Shifted left 72 and up 155

Problem 8

- Write the equation for the following graph



- Solution: y = -|x + 3|

System of Equations

Solving systems of equations

AggieMathLearningCenter

Solving system of equations

- You are looking for a solution that makes all equations true.

- Different methods for solving systems of equations include:
  - Graphing, the solution is where the graphs cross
  - Substitution, solving one equation for a single variable and plugging it into the other equation
  - Elimination, eliminating a variable using both equations

Problem 9

- Solve the system of equations:

$$y = \frac{-3}{5}x + 1$$

$$2x + 3y = 2$$

- Solution: (-5,4)

Problem 10

- Solve the system of equations:

$5x + y = 0$

$-4x - y + 4$

- Solution: (4,-20)

Other Resources

- Aggie Math Learning Center
  - Visit usu.edu/math/amlc for more videos, resources, tutoring times, and recitation leader office hours