Math 0995 CBE 5 Review

UtahStateUniversity

AggieMathLearningCenter

CBE 5

- Covers lessons 27-32
  - Extracting Square Roots to Solve an Equation
  - The Quadratic Formula
  - Solving Linear Inequalities
  - Solving Linear Inequalities with an Absolute Value
  - Functions
  - Two-Variables Equations and Graphs

Extracting Square Roots

Extracting Square Roots to Solve an Equation

Using Roots to Solve Problems

- You can take the square root of both sides of an equation in order to solve equations
  - Don’t forget the plus/minus

Problem 1

- Determine the real number solutions to the equation $(5x-3)^2 = 81$

- Solution: $\frac{12}{5}, \frac{-6}{5}$

The Quadratic Formula

Formula, use, and examples

Quadratic Formula

- The quadratic formula is a formula you can use to solve ANY quadratic equation you have in the right form

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Problem 2

- Determine the real number solutions to the equation $2x^2 - 1 = 2x$

- Solution: $\frac{1+\sqrt{3}}{2}, \frac{1-\sqrt{3}}{2}$

Problem 3

- Determine the real number solutions to the equation
- $(x-3)(x+4) = 3$

- Solution: $\frac{-1+\sqrt{61}}{2}, \frac{-1-\sqrt{61}}{2}$

Problem 4

- Determine the real number solutions to the equation

$$\frac{3}{x+2} - \frac{1}{x^2+4x+4} = 2$$

- Solution: $-\frac{3}{2}, -1$

Solving Linear Inequalities

How to solve linear inequalities

Solving Linear Inequalities

- Solving Linear Inequalities is just like solving a regular equation, except when you multiply or divide both sides of an equation by a NEGATIVE number, you reverse the inequality

Problem 5

- Solve the inequality $3x - 9(5x + 4) \geq -5$

- Solution: $(-\infty, -\frac{31}{42}]$

Solving Linear Inequalities with Absolute Values

- Combine what we know about solving equations with absolute values and what we know about solving inequalities

- First isolate the absolute value

- Then set up the two scenarios that will account for the negative and positive possibilites

Problem 6

- Solve the inequality $|5x - 2| \leq 10$

- Solution: $[-\frac{7}{5}, \frac{11}{5}]$

Problem 7

- Solve the inequality $|x+9|+3 \geq 3$

- Solution: $(-\infty, \infty)$

Functions

Definitions, domains, ranges

Functions

- A function means every input has exactly one output

- Functions pass the vertical line test

- f(x) is a way of writing the output of a function when the input is x

- Domain of a function is all the x inputs that have an output
- Range of a function is all the possible outputs of a function

Problem 8 – Part 1

- If $f(x) = \dfrac{x^2}{2+4x}$ then find f(3)

- Solution: $f(3) = \dfrac{9}{14}$

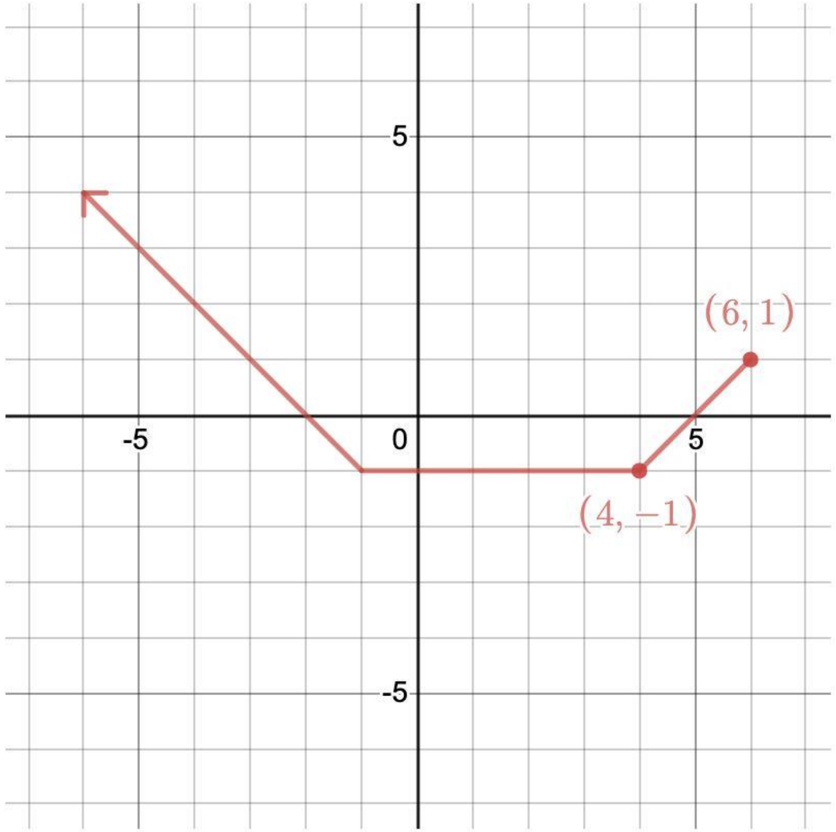
Problem 8 – Part 2

- If $f(x) = \dfrac{x^2}{2+4x}$ then find f(x+h)

- Solution: $f(x+h) = \dfrac{(x+h)^2}{2+4(x+h)} = \dfrac{x^2+2xh+h^2}{2+4x+4h}$

Problem 9

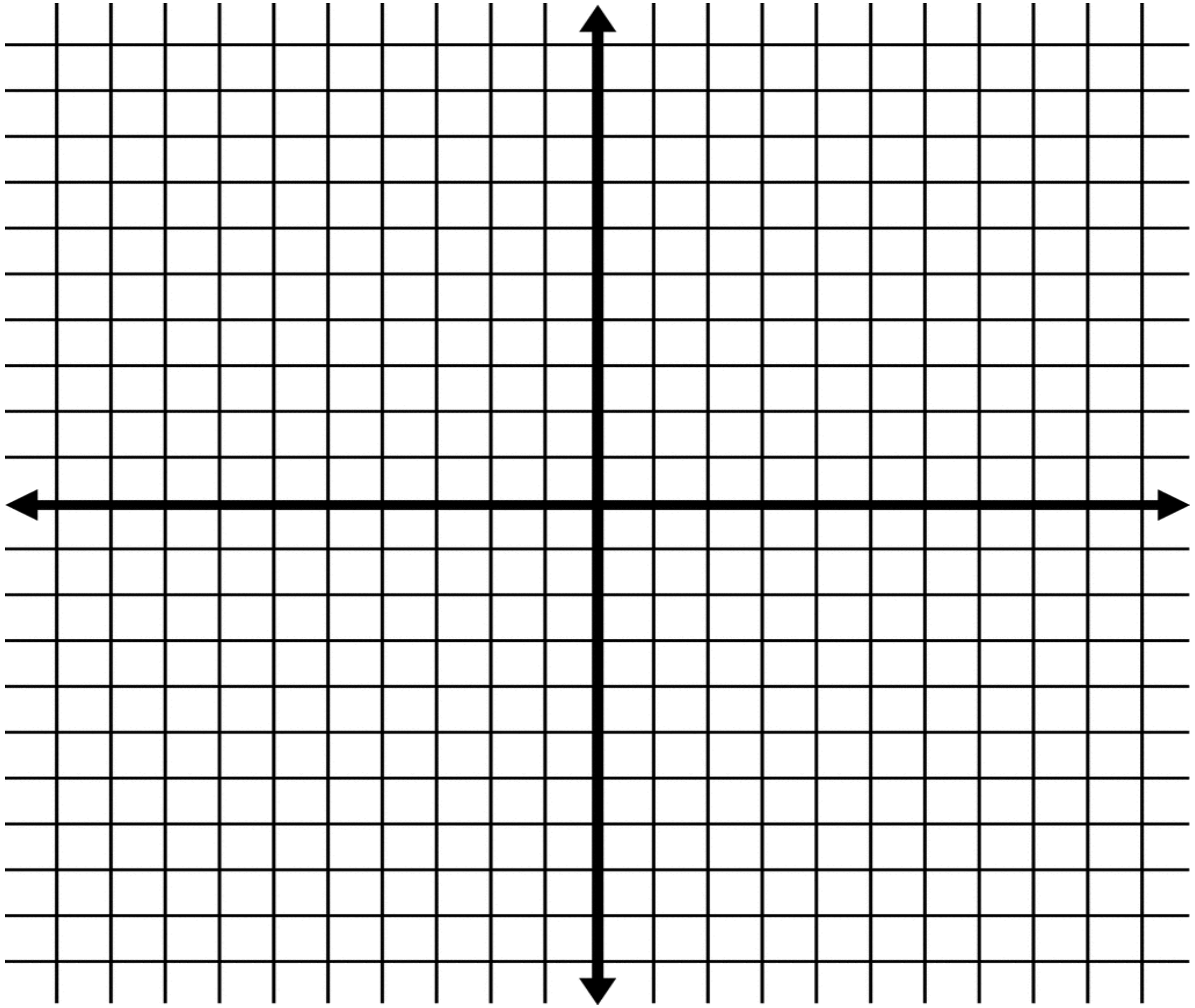
- Find the domain and range for the function that is shown:



- Solution: Domain: $(-\infty, 6]$ Range: $[-1, \infty)$

Problem 10

- Plot the following points: (3, 7), (2, 4), (1, 5), (4, -2), (-6, 0)



Other Resources

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