

Math 1050 CBE 1 Review

UtahStateUniversity

CBE 1

- Covers lessons 1-6
 - Intro to Complex Numbers
 - Solving Equations
 - Intro to Functions
 - Function Notation
 - Graphs of Functions
 - Graphs of Common Functions

Complex Numbers

adding, subtracting, multiplying and dividing complex numbers

Intro to Complex Numbers

- What are complex numbers?

$$i = \sqrt{-1}$$

$$i^2 = -1$$

$$a + bi$$

Problem 1

- Perform the indicated operations and write the complex number in the standard form $a+bi$

$$-i + \frac{5 + 3i}{2 + 3i}$$

Part 1 – Multiplying & Dividing Complex Numbers

- Dividing Complex Numbers:
 - Multiply denominator by conjugate
 - Multiply numerator by the same
 - Distribute
 - Simplify

$$-i + \frac{5 + 3i}{2 + 3i}$$

Part 2 – Adding & Subtracting Complex Numbers

- Add and subtract like terms

$$-i + \frac{5 + 3i}{2 + 3i}$$

Solving Equations

adding, subtracting, multiplying and dividing complex numbers

Problem 2

True or False: The imaginary number $-\sqrt{4}i$ is a solution to the equation $x^4 - 16 = 0$.

Problem 3

- Determine all the complex solutions to the equation
 - Distribute
 - Set equal to zero
 - Quadratic formula:

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

$$(x + 1)(x + 2) = 1$$

Problem 4

- Determine all the real number solutions to the rational equation
 - Factor
 - Least Common Multiple of Denominator
 - Solve for x
 - Factor
 - Or use quadratic equation
 - Check answers for division by zero

$$\frac{3x}{x-5} - \frac{39}{x^2-5x} = 2$$

Zero Factor Property

- If the product of two or more numbers is equal to zero, then at least one of the numbers must be equal to zero.

$$67x(3x - 1)(x + 7)\left(\frac{5x - 3}{4}\right)(x^2 - 1) = 0$$

Problem 5

- Determine all the real number solutions to the equation

$$\sqrt{4x + 3} \cdot (3x^2 + 2x - 2) \cdot (25x^2 - 20x + 4) = 0$$

- Zero Factor property
- Factor or quadratic equation

Problem 6

- Determine all the complex solutions to the equation
 - Let $U = x^2$
 - Solve for U
 - Quadratic Formula or Factor
 - Solve for X

$$x^4 - 8x^2 = 20$$

Intro to Functions

domain, range, interval notation, evaluating functions

Domain of a Function

- All inputs of a function
 - Specifically, any real number input that has a real number output.

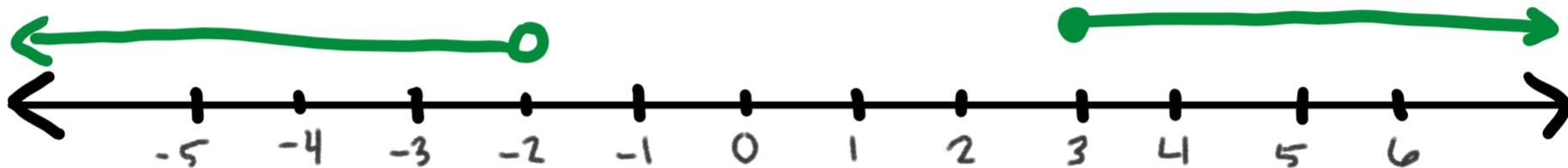
Problem 7

- What is the domain of the function f defined by the set

$$\{(-1, 2), (1, 4), (-2, 6), (2, 8), (-5, 10), (5, 12), (-7, 14)\}$$

Interval Notation

- $()$ means not included
- $[\]$ means included
- Write your intervals starting with the lowest number and ending with the greatest number, connecting intervals with \cup .



Problem 8

The function g is defined by the equation:

$$g(x) = \begin{cases} x^2 & \text{if } -5 \leq x < -2 \\ 2x & \text{if } 4 < x < 6 \\ 5 & \text{if } x = 2 \end{cases}$$

- Use interval notation to write the domain of g

Problem 9

$$h(x) = \frac{-3x-2}{\sqrt{8x-3}} - \frac{1}{6x+5}.$$

- Use interval notation to write the domain of h
 - Look for fractions and square roots

Problem 10

$$f(x) = 3x^2 - 4x + 8$$

- Evaluate

$$f(2)$$

$$f(x + h)$$

Other Resources

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

