

Math 0995 CBE 4 Review

UtahStateUniversity

CBE 4

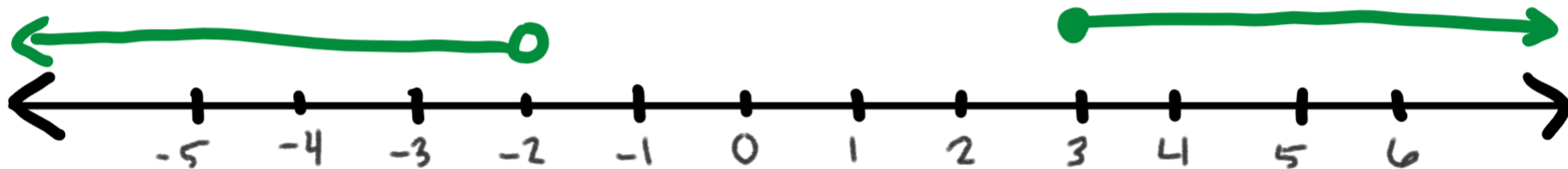
- Covers lessons 20-26
 - Sets and Notations for Sets
 - Solutions of Equations and Properties of Equality
 - Solving Linear Equations
 - Solving Absolute Value Equations
 - Solving Equations Using the Zero-Factor Property
 - Solving Rational Equations
 - Solving Equations with Radical Terms

Sets and Notations for Sets

Interval Notation

Interval Notation

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



Problem 1

- Describe the set of all real numbers that are greater than or equal to 3 and less than or equal to 18, using interval notation.

- Solution: $[3, 18]$

Solving Linear Equations

Definition of Solutions, how to solve linear equations

Solving Linear Equations

- A solution is any value that make the equation true
- Linear equations are equations where the variable is only to the first power (no exponent)
- Linear equations usually have one solution, but they may have no solutions or infinitely many solutions
- Find the solutions by “unpeeling” what is happening to the variable.
- Need to maintain the truth
- Rewrite to get variable = a value

Problem 2

- Solve the equation and write the solutions in exact form:

$$\frac{4}{5}x + 3 = -\frac{2}{5}x - 9$$

- Solution: $x = -10$

Problem 3

- Solve the equation and write the solutions in exact form:

$$3(4x - 5) + 8 = 5(3 - 3x)$$

- Solution: $x = 22/27$

Solving Absolute Value Equations

Definition of absolute value, how to solve absolute value equations

Solving Absolute Value Equations

- Absolute value is a distance, which means the absolute value is always positive (not the variable)
- Find the solutions by first isolating the absolute value
- Then evaluate if there is a solution, remember absolute values cannot be negative
- Then set up two equations to find the possible values of the variable that make the equation true

Problem 4

- How many solutions are there to $6|7x + 4| + 9 = 4$

- Solution: No solutions

Problem 5

- Solve the following equation and write the solution/s in exact form

$$3|4x + 5| - 10 = 2$$

- Solution: $x = -1/4$ and $x = -9/4$

Solving Equations With the Zero Factor Property

Zero factor property and solving with the zero factor property

Zero Factor Property

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

Solving With the Zero Factor Property

- First get all numbers onto one side so everything is equal to zero.
- Then factor.
- Then set every factor equal to zero and solve.

Problem 6

- Solve the equation and write the solution in exact form

$$5x^2 + 30 = -25x$$

- Solution: $x = -2$ and $x = -3$

Solving Rational Equations

Definition of rational equations, and how to solve them

Solving Rational Equations

- Rational Equations are big fraction problems
- To solve rational equations, begin by multiplying by the LCM of the denominators
- Then solve the remaining equation
- Then check answers to make sure that you don't divide by 0

Problem 7

- Solve the equation and write the solution in exact form:

$$\frac{3(x - 6)}{3} = \frac{3(x + 1)}{8}$$

- Solution: 153/15

Problem 8

- Solve the equation and write the solution in exact form

$$\frac{3}{2} + \frac{12}{x} + \frac{5}{18} = 1$$

- Solution: $-108/7$

Problem 9

- Solve the equation and write the solution in exact form

$$\frac{2}{x-2} - \frac{4}{x^2-3x+2} = \frac{5}{x-1}$$

- Solution: $\frac{4}{3}$

Solving Radical Equations

Definition of radical equations, and how to solve them

Solving Radical Equations

- Radical Equations are equations with roots in them
- To solve radical equations, start by isolating the radical
- Undo the radical with exponents (squaring)
- Then solve the remaining equation
- Check your answers, sometimes when squaring we introduce extra solutions that are not true.

Problem 10

- Solve the equation and write the solution/s in exact form

$$x - \sqrt{2x + 4} = -2$$

- Solution: $x = 0$ and $x = -2$

Other Resources

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

