Math 0995 CBE 1 Review

UtahStateUniversity

AggieMathLearningCenter

CBE 1

- Covers lessons 1-6 +19
  - Factors
  - Fractions
  - Real Numbers
  - Exponents
  - Order of Operations
  - Algebraic Expressions and Algebraic Equations
  - Logarithms

Factors

Finding, Using, LCM

Factors

- Factors of a number are numbers that multiply to the number
- When you factor something you write it as a multiplication problem, a product of numbers
- **Prime Factorization** is where a number is written as a product of prime numbers

Problem 1

- Find all factors of the number 24

- Solution: 1, 2, 3, 4, 6, 8, 12, 24

Problem 2

- Find the prime factorization for 180

- Solution: 2*2*3*3*5

Least Common Multiple

- The smallest number that is a multiple of all the numbers
- To find the LCM we list multiples of the numbers and find the smallest one that is in all lists.

Problem 3

- Find the LCM of the following numbers: 3,4,6

- List the multiples of 3
- List the multiples of 4
- List the multiples of 6

- Identify the least common multiple

- Solution: 12

Fractions

Definition, Multiplication, Division, Addition, Subtraction

Fractions

- A way of writing division

- a/b = c if and only if c * b = a

- Numerators are the “tops” of fractions
- Denominators are the “bottoms” of fractions

Multiplying and Dividing Fractions

- In order to multiply fractions, we multiply numerators and we multiply denominators

- In order to divide by a fraction, we can multiply by the reciprocal
  - The reciprocal of a fraction is the “flipped” version, where the numerator is now the denominator, and the denominator is now the numerator.

- Tip: you can simplify while you are multiplying.

Problem 4

- Perform the indicated operation and give your answer in the simplest form

$$\frac{35}{24} \div \frac{15}{8}$$

- Solution: 7/9

Adding and Subtracting Fractions

- Adding and subtracting fractions is the exact same
- In order to add or subtract fractions the denominators must be the same, so the first step is to rewrite the fractions with a common denominator
- Then we can add/subtract the numerators together and keep the common denominator

Problem 5

- Perform the indicated operation and give your answer in the simplest form

$$\frac{4}{3} - \frac{4}{6}$$

- Solution: 2/3

Problem 6

- Simplify the complex fraction. Give your answer in lowest terms

$$\frac{\frac{-7}{8}}{\frac{1}{2}-\frac{1}{3}}$$

- Solution: -21/4

Real Numbers

Definition and Other Sets

Natural Numbers

- No Decimals
- No Fractions
- No Negatives
- No 0

Whole Numbers

- No Decimals
- No Fractions
- No Negatives

Integers

- No Decimals
- No Fractions

Rational Numbers

- Any number that can be written as a fraction
  - Decimals must stop or have a never-ending pattern

Irrational Numbers

- Decimals that don’t stop and don’t have a pattern

Real Numbers

- No imaginary numbers

Problem 7

- What number sets do the following number belong to?
- -12.75, 8, π

- Solutions:
  - -12.75: Rational numbers, Real numbers
  - 8: Natural numbers, Whole numbers, Integers, Rational numbers, Real numbers
  - π: Irrational numbers, Real numbers

Exponents

Definition, Multiplying, Dividing

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Exponents

- Exponents tell how many times something is being multiplied
- Exponent Rules:

$$(a^b)(a^c) = a^{(b+c)}$$

$$(a^b)^c = a^{(bc)}$$

$$\frac{a^b}{a^c} = a^{(b-c)}$$

$$a^{-b} = \frac{1}{a^b}$$

$$a^0 = 1$$

Problem 8

- Simplify the expression $(3y^4)\,(-4y^3)$

- Solution: $-12y^7$

Problem 9

- Simplify the expression $\frac{\left(2x^{-1}\right)^{-3}}{(2x)^{1}}$ write the result with no negative exponents

- Solution: $\frac{x^2}{16}$

Order of Operations

Order of Operations

- Parenthesis
- Exponents
- Multiplication/Division
- Addition/Subtraction

Algebraic Expressions and Algebraic Equations

Differences, Simplifying, and Solving

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Expressions vs Equations

- Expressions have a value, and we cannot change that value
- Equations have a truth (equal sign) and we can do lots with them as long as we don't change that truth
- Vocabulary:
  - Like terms and distribute

Problem 10

- Evaluate the expression: $\dfrac{15+|4-8|-4^2}{8-6}$

- Solution: 3/2

Problem 11

- Simplify the expression: $3\left(3k-1\right)-5\left(k+1\right)$

- Solution: 4k - 8

Other Resources

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