Prime Factorization Worksheet Answer Key PDF

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Part 1: Building a Foundation

What is a prime number?

undefined. A) A number that can be divided by 1 and itself only ✓

undefined. B) A number that can be divided by 2 and 3

undefined. C) A number that has more than two factors

undefined. D) A number that is even

A prime number is a number that can only be divided by 1 and itself.

Which of the following numbers are prime? (Select all that apply)

undefined. A) 2 ✓

undefined. B) 4

undefined. C) 11 ✓

undefined. D) 15

The prime numbers from the list are 2 and 11.

Explain the process of prime factorization in your own words.

Prime factorization involves dividing a number by prime numbers until only 1 remains.

List the prime factors of the following numbers:

1. 18

2, 3

2. 30

2, 3, 5

The prime factors of 18 are 2 and 3; the prime factors of 30 are 2, 3, and 5.

Part 2: Understanding and Interpretation

Which method involves creating a tree diagram to break down a number into its prime factors?

undefined. A) Division Method

undefined. B) Factor Tree Method ✓

undefined. C) Subtraction Method

undefined. D) Addition Method

The factor tree method uses a tree diagram to show the breakdown of a number into its prime factors.

Why is prime factorization important? (Select all that apply)

undefined. A) It helps in simplifying fractions ✓

undefined. B) It is used in cryptography ✓

undefined. C) It helps in finding the square root of numbers

undefined. D) It is used to identify even numbers

Prime factorization is important for simplifying fractions, cryptography, and finding the LCM.

Describe how prime factorization can be used to find the greatest common divisor (GCD) of two numbers.

To find the GCD, list the prime factors of both numbers and multiply the lowest powers of common prime factors.

Part 3: Application and Analysis

What is the prime factorization of 84?

undefined. A) 2 × 2 × 3 × 7 ✓

undefined. B) 2 × 3 × 5 × 7

undefined. C) 2 × 2 × 2 × 3

undefined. D) 3 × 3 × 3 × 7

The prime factorization of 84 is 2 × 2 × 3 × 7.

Using prime factorization, which of the following pairs of numbers have a GCD of 6? (Select all that apply)

undefined. A) 18 and 24 ✓

undefined. B) 12 and 30 ✓

undefined. C) 14 and 28

undefined. D) 6 and 18

The pairs with a GCD of 6 are 18 and 24, and 12 and 30.

Apply the prime factorization method to find the least common multiple (LC M) of 8 and 12. Show your work.

The LCM of 8 and 12 can be found by taking the highest powers of all prime factors.

If the prime factorization of a number is $2^2 \times 3 \times 5$, what is the original number?

undefined. A) 30

undefined. B) 60 ✓

undefined. C) 180

undefined. D) 90

The original number is 60.

Part 4: Evaluation and Creation

Which of the following statements is true about the prime factorization of any even number?

undefined. A) It always includes the factor 2 ✓

undefined. B) It always includes the factor 3

undefined. C) It always includes the factor 5

undefined. D) It always includes the factor 7

The true statement is that it always includes the factor 2.

Evaluate the following statements and select those that are true regarding prime factorization. (Select all that apply)

undefined. A) Every composite number has a unique prime factorization ✓

undefined. B) Prime factorization can be used to simplify algebraic expressions ✓

undefined. C) Prime factorization is only applicable to even numbers

undefined. D) Prime factorization helps in finding the LCM of two numbers ✓

The true statements are that every composite number has a unique prime factorization, and prime factorization helps in finding the LCM.

Create a real-world scenario where prime factorization could be used to solve a problem. Describe the scenario and how prime factorization would be applied.

A scenario could involve organizing items into groups based on their quantities, using prime factorization to determine the best grouping.