Prime And Composite Numbers Worksheets Questions and Answers PDF

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Part 1: Building a Foundation

Which of the following numbers is a prime number?

Hint: Remember that a prime number has exactly two distinct positive divisors.

- ◯ A) 4
- ◯ B) 9
- ◯ **C) 11 ✓**
- ◯ D) 15

> The correct answer is C) 11, as it is only divisible by 1 and itself.

Select all the composite numbers from the list below:

Hint: Composite numbers have more than two divisors.

- ☐ A) 2
- ☐ **B) 6 ✓**
- ☐ C) 13
- ☐ **D) 18 ✓**

> The correct answers are B) 6 and D) 18, as they have more than two divisors.

Define a prime number in your own words.

Hint: Consider the number of divisors a prime number has.

A prime number is a natural number greater than 1 that cannot be formed by multiplying two smaller natural numbers.

List two examples of prime numbers and two examples of composite numbers.

Hint: Think of numbers you know that fit each category.

1. Prime Number 1

2

2. Prime Number 2

5

3. Composite Number 1

4

4. Composite Number 2

6

> Examples of prime numbers include 2 and 5; examples of composite numbers include 4 and 6.

Which statement is true about the number 1?

Hint: Consider the definitions of prime and composite numbers.

- ◯ A) It is a prime number.
- ◯ B) It is a composite number.
- ◯ **C) It is neither prime nor composite. ✓**
- ◯ D) It is both prime and composite.

> The correct answer is C) It is neither prime nor composite.

Part 2: Comprehension and Application

Which of the following statements are true about composite numbers?

Hint: Think about the properties of composite numbers.

- ☐ A) They have exactly two divisors.
- ☐ **B) They can be expressed as a product of prime numbers. ✓**
- ☐ C) They are always even numbers.
- ☐ **D) They have more than two divisors. ✓**

> The correct answers are B) They can be expressed as a product of prime numbers and D) They have more than two divisors.

Explain why the number 2 is considered a special prime number.

Hint: Consider its properties compared to other prime numbers.

> **The number 2 is the only even prime number, as all other even numbers can be divided by 2.**

What is the prime factorization of 28?

Hint: Break down the number into its prime factors.

- ◯ A) 2 × 14
- ◯ **B) 2 × 2 × 7 ✓**
- ◯ C) 4 × 7
- ◯ D) 2 × 2 × 2 × 3

> The correct answer is B) 2 × 2 × 7.

Find the prime factorization of 60 and list the prime factors.

Hint: Use division by prime numbers to find the factors.

1. Prime Factorization

> 2 × 2 × 3 × 5

2. Prime Factors

> 2, 3, 5

> The prime factorization of 60 is 2 × 2 × 3 × 5, with prime factors 2, 3, and 5.

Describe a real-world scenario where identifying prime numbers might be useful.

Hint: Think about applications in technology or security.

Identifying prime numbers is crucial in cryptography, where they are used to secure data.

If a number is divisible by both 2 and 3, which of the following must it also be divisible by?

Hint: Consider the least common multiple of 2 and 3.

- ◯ A) 5
- ◯ **B) 6 ✓**
- ◯ C) 9
- ◯ D) 12

The correct answer is B) 6, as it is the product of 2 and 3.

Part 3: Analysis, Evaluation, and Creation

Analyze the following numbers and select those that are prime:

Hint: Check each number for divisibility.

- ☐ **A) 17 ✓**
- ☐ B) 21
- ☐ **C) 23 ✓**
- ☐ D) 25

The correct answers are A) 17 and C) 23, as they are only divisible by 1 and themselves.

Explain how the fundamental theorem of arithmetic applies to the number 45.

Hint: Consider the unique factorization of numbers.

The fundamental theorem of arithmetic states that every integer greater than 1 can be expressed uniquely as a product of prime factors, such as 45 = 3 × 3 × 5.

Which of the following is a correct analysis of the number 30?

Hint: Consider the number of divisors and its factorization.

- ◯ A) It is a prime number.
- ◯ **B) It has more than two divisors. ✓**
- ◯ C) It cannot be factored into prime numbers.
- ◯ D) It is neither prime nor composite.

> The correct answer is B) It has more than two divisors.

Evaluate the importance of prime numbers in modern cryptography and provide an example.

Hint: Think about how prime numbers are used in encryption algorithms.

> **Prime numbers are essential in cryptography for secure communication, such as in RSA encryption, which relies on the difficulty of factoring large prime products.**

Create a composite number using the prime numbers 3, 5, and 7, and explain your process.

Hint: Think about how to combine these primes.

1. Composite Number

> 15

2. Process Explanation

> 3 × 5 = 15

A composite number can be created by multiplying the primes, such as 3 × 5 = 15 or 5 × 7 = 35.

Which of the following statements best evaluates the role of prime numbers in mathematics?

Hint: Consider the applications of prime numbers beyond basic arithmetic.

- ◯ A) They are only important for basic arithmetic.
- ◯ B) They have no significant applications.
- ◯ **C) They are fundamental to number theory and cryptography. ✓**
- ◯ D) They are rarely used in advanced mathematics.

The correct answer is C) They are fundamental to number theory and cryptography.

Propose a method to quickly determine if a number less than 100 is prime, and explain your reasoning.

Hint: Consider the divisibility rules for small numbers.

One method is to check divisibility by prime numbers up to the square root of the number, which helps identify primes efficiently.