Definition of composite number in math

SEO Summary (158 characters): Unlock the mystery of composite numbers! Learn the precise mathematical definition, explore examples, and understand how they differ from prime numbers. This guide provides clear explanations, visuals, and frequently asked questions for a thorough grasp of this core mathematical concept.

Decoding Composite Numbers: A Comprehensive Guide

Composite numbers are a fundamental concept in number theory, forming a crucial building block for understanding more complex mathematical structures. Understanding what constitutes a composite number is key to unlocking many areas of mathematics, from basic arithmetic to advanced algebra and cryptography. This dives deep into the definition, provides examples, and explores related concepts to solidify your understanding. *Definition of a Composite Number:* A composite number is a positive integer greater than 1 that has at least one divisor other than 1 and itself. In simpler terms, a composite number can be factored into smaller whole numbers. For example, the number 6 is a composite number because it can be factored into 2 × 3. Conversely, a number that cannot be factored into smaller whole numbers (other than 1 and itself) is called a prime number. The number 1 is neither prime nor composite. **Distinguishing Composite from Prime Numbers:** The following table helps visualize the fundamental difference between prime and composite numbers: | Number | Factors | Type | | | | | 2 | 1, 2 | Prime | | 3 | 1, 3 | Prime | | 4 | 1, 2, 4 | Composite | | 5 | 1, 5 | Prime | | 6 | 1, 2, 3, 6 | Composite | | 7 | 1, 7 | Prime | | 8 | 1, 2, 4, 8 | Composite | | 9 | 1, 3, 9 | Composite | | 10 | 1, 2, 5, 10| Composite | **Identifying Composite Numbers:** There's no single, quick method to definitively identify *all* composite numbers, as the process involves testing for divisors. However, several strategies exist: • *Trial Division:* Systematically divide the number by integers starting from 2, up to its square root. If any integer divides the number evenly (leaving a remainder of 0), the number is composite. • *Factorization:* Attempt to find factors of the number. If you find any factors besides 1 and the number itself, it's composite. • Recognizing Patterns: While not foolproof, some numbers reveal their composite nature through visual patterns. For instance, even numbers (except 2) are always composite. Numbers ending in 0 or 5 (excluding 5 itself) are also usually composite. Advantages of Understanding Composite Numbers: While not having direct "advantages" in the same way practical skills do, a robust understanding of composite numbers is a fundamental cornerstone for numerous mathematical applications:

Fundamental Theorem of Arithmetic

The Fundamental Theorem of Arithmetic states that every integer greater than 1 can be uniquely represented as a product of prime numbers (ignoring the order of the factors). This theorem hinges on the distinction between prime and composite numbers. Understanding composite numbers is critical to grasping this central theorem and its implications in various mathematical fields.

Cryptography

Modern cryptography, which secures online transactions and communications, relies heavily on prime numbers and composite numbers. Many encryption algorithms leverage the difficulty of factoring large composite numbers into their prime factors. The security offered by these algorithms depends directly on this computational challenge.

Modular Arithmetic

Composite numbers play a significant role in modular arithmetic, a system of arithmetic for integers where numbers “wrap around” upon reaching a certain value (the modulus). Many applications of modular arithmetic, such as in computer science and cryptography, rely on properties of composite numbers.

Number Theory Research

Composite numbers are a constant area of research in number theory. Understanding their distribution, properties, and relationships with prime numbers contributes heavily to our understanding of the fundamental structure of numbers. Conclusion: The concept of composite numbers might appear simple at first glance, but its significance in mathematics is profound. From the foundational theorem of arithmetic to sophisticated cryptographic algorithms, a strong understanding of composite numbers is essential for navigating advanced mathematical concepts. By mastering the definition, strategies for identification, and appreciating its applications, you unlock a deeper appreciation of the intricate world of numbers and their underlying structure. *Advanced FAQs:* 1. Are all even numbers composite? No, the number 2 is an even prime number. All other even numbers are composite. 2. *Can a composite number have only one prime factor?* Yes, but it must be raised to a power greater than 1. For example, $9 = 3^2$, so 9 is a composite number with only one prime factor (3). 3. *What is the smallest composite number?* 4 is the smallest composite number. 4. **How do I determine the number of divisors of a composite number?** Find the prime factorization of the number. Add 1 to each exponent in the prime factorization, then multiply these sums together to find the total numbers of divisors. For example, $12 = 2^2 * 3^1$, so it has (2+1)(1+1) = 6 divisors (1, 2, 3, 4, 6, 12). 5. **What is the relationship between composite numbers and perfect numbers?** A perfect number is a positive integer that is equal to the sum of its proper divisors (divisors excluding itself). Some perfect numbers are related to Mersenne primes, which are prime numbers of the form $2^p - 1$, where p is a prime number. This relationship touches upon the interconnectedness between prime and composite numbers in number theory.

Unveiling the Mystery: What Exactly is a Composite Number in Math?

Math can sometimes feel like a secret code, filled with fascinating concepts that, once decoded, reveal a beautiful order to the universe. Among these fundamental building blocks are numbers, and not all numbers are created equal. We often hear about prime numbers – those elusive digits that seem to stand alone. But what about their counterparts, the composite numbers? In this comprehensive exploration, we're going to dive deep into the definition of a composite number, unraveling its characteristics, how to identify them, and why they are so crucial in the grand scheme of mathematics. Forget dry textbooks for a moment. Imagine numbers as tiny LEGO bricks. Some bricks are unique, only able to be divided by themselves and the number one. These are our primes. But others, the composite numbers, are like the more common bricks – they can be broken down into smaller, more fundamental pieces. Let's embark on this journey of discovery together.

The Core Definition: Breaking Down the Basics

At its heart, a **composite number in math** is a positive integer that has at least one divisor or factor other than one and itself. That's the fundamental difference between a composite number and a prime number. Let's break that down further: * **Positive Integer:** We're talking about whole numbers greater than zero (1, 2, 3, 4, and so on). We're not concerned with fractions, decimals, or negative numbers when discussing composite numbers. * **Divisor/Factor:** A divisor or factor of a number is a number that divides it evenly, leaving no remainder. For instance, the factors of 12 are 1, 2, 3, 4, 6, and 12. * **"At least one divisor other than one and itself":** This is the key phrase. If a number has *any* factor besides 1 and itself, it qualifies as composite. Think of it this way: If you can group a set of objects into equal smaller groups (where the number of groups and the number of objects in each group are both greater than 1), then the total number of objects is composite.

Examples to Illuminate the Concept

Seeing is believing, and examples are the best way to solidify our understanding of composite numbers. * **The Number 4:** Is 4 composite? Let's check its factors. The factors of 4 are 1, 2, and 4. Since it has the factor '2' (which is neither 1 nor 4), **4 is a composite number**. We can also think of it as two groups of two. * **The Number 6:** What about 6? Its factors are 1, 2, 3, and 6. It has factors '2' and '3'. Therefore, **6 is a composite number**. You can make two groups of three, or three groups of two. * **The Number 10:** The factors of 10 are 1, 2, 5, and 10. With factors '2' and '5', **10 is a composite

number**. It can be represented as two groups of five or five groups of two. * **The Number 15:** Factors of 15 include 1, 3, 5, and 15. Because it has factors '3' and '5', **15 is a composite number**. It can be seen as three groups of five or five groups of three. Now, let's contrast this with prime numbers. * **The Number 7:** The factors of 7 are only 1 and 7. It doesn't have any other factors. Thus, **7 is a prime number**, not composite. * **The Number 11:** The factors of 11 are only 1 and 11. **11 is a prime number**.

The Special Case of the Number 1

You might be wondering about the number 1. Where does it fit in? The number 1 is a bit of an anomaly. By definition, a prime number must have exactly two distinct positive divisors: 1 and itself. The number 1 only has one positive divisor: itself (which is 1). Similarly, a composite number must have *at least three* positive divisors (1, itself, and at least one other). Since 1 only has one divisor, it doesn't fit the definition of either a prime or a composite number. Therefore, **1 is neither prime nor composite**. It's in a category all its own!

How to Identify a Composite Number: The Factor Test The most straightforward way to determine if a number is composite is by finding its factors. Here's a systematic approach: 1. **Start with the number you want to test.** Let's say we want to know if 21 is composite. 2. **Begin testing small prime numbers as potential divisors.** Start with 2. Does 2 divide 21 evenly? No. 3. **Move to the next prime number, 3.** Does 3 divide 21 evenly? Yes! $21 \div 3 = 7$. 4. **You've found a factor other than 1 and 21!** Since 3 is a factor of 21, and 3 is not 1 and not 21, we can confidently say that **21 is a composite number**. We don't even need to test further. **Key point:** If you find *any* factor between 1 and the number itself, you've proven it's composite. **Optimization Tip for Factor Testing:** You only need to test potential divisors up to the square root of the number you are testing. If you haven't found a factor by then, the number is likely prime (unless it's a perfect square, in which case its square root is a factor). Let's try a larger number, say 36: * Is 36 divisible by 2? Yes ($36 \div 2 = 18$). So, **36 is composite**. We can stop here. Let's try 29: * Is 29 divisible by 2? No. * Is 29 divisible by 3? No. * Is 29 divisible by 5? No. * The square root of 29 is approximately 5.38. We've tested all primes up to 5. Since we haven't found a factor, **29 is a prime number**. This factor testing method is a fundamental concept in number theory and is the basis for many algorithms in computer science.

The Fundamental Theorem of Arithmetic: The Power of Composite Numbers Composite numbers aren't just arbitrary; they hold a special place in mathematics due to a cornerstone principle known as the **Fundamental Theorem of Arithmetic**. This theorem states that every integer greater than 1 can be uniquely represented as a product of prime numbers, ignoring the order of these prime factors. This means that any composite number can be broken down into its "prime building blocks." These prime building blocks are unique for each composite number. Let's see this in action: * **Composite Number 12:** We know 12 is composite. Its prime factorization is $2 \times 2 \times 3$ (or $2^2 \times 3$). No matter how you try to factor 12, you'll always end up with these prime factors. * **Composite Number 30:** The prime factorization of 30 is $2 \times 3 \times 5$. Again, this combination of primes is unique to 30. * **Composite Number 100:** We can factor 100 as $2 \times 2 \times 5 \times 5$ (or $2^2 \times 5^2$). The fact that composite numbers can be uniquely decomposed into primes is incredibly powerful. It's like having a master key that can unlock the secrets of any composite number by revealing its irreducible prime components. This uniqueness is what makes studying composite numbers so foundational to number theory and various branches of mathematics.

Why Do We Care About Composite Numbers? Applications and Significance You might be thinking, "This is interesting, but what's the practical use of knowing about composite numbers?" The answer is: a lot! * **Cryptography and Security:** The difficulty of factoring large composite numbers into their prime factors is the bedrock of many modern encryption algorithms. For example, RSA encryption relies on the fact that it's computationally very hard to find the prime factors of a large semiprime (a number that is the product of two prime numbers). The security of online transactions, secure communications, and digital signatures all depend on this property of

composite numbers. * **Computer Science Algorithms: Algorithms for primality testing and factorization are fundamental in computer science, used in areas like data compression, error correction codes, and scientific simulations. Understanding composite numbers is essential for developing and analyzing these algorithms. * **Number Theory Research:** Composite numbers are central to ongoing research in number theory, exploring patterns, distribution, and relationships between numbers. Concepts like Mersenne primes and perfect numbers often involve the properties of composite numbers. * **Basic Arithmetic and Algebra:** Even at a foundational level, understanding composite numbers helps in simplifying fractions, finding the least common multiple (LCM) and greatest common divisor (GCD) of numbers, and factoring algebraic expressions.**

Composite Numbers vs. Prime Numbers: A Recap To solidify your understanding, let's quickly summarize the key distinctions: | Feature | Composite Number | Prime Number | | : | : | : | | **Definition** | Positive integer with more than two factors. | Positive integer with exactly two factors (1 and itself). | | **Factors** | Has at least one factor other than 1 and itself. | Only has factors 1 and itself. | | **Examples** | 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 27, 28, 30... | 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31... | | **Fundamental Theorem** | Can be uniquely represented as a product of primes. | Cannot be factored into smaller primes. | | **The Number 1** | Neither prime nor composite. | Neither prime nor composite. |**

The Sequence of Composite Numbers Looking at the sequence of composite numbers can reveal interesting patterns. The first few composite numbers are: 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 27, 28, 30. Notice how prime numbers (like 2, 3, 5, 7, 11, 13, 17, 19, 23, 29) become increasingly spaced out as numbers get larger. This observation led to many conjectures and research**

questions in number theory, such as the famous Riemann Hypothesis, which is concerned with the distribution of prime numbers.

In Conclusion: The Essential Nature of Composite Numbers So, what is the definition of a composite number in math? It's a positive integer that can be formed by multiplying two smaller positive integers. It's a number that, unlike its prime cousins, isn't indivisible by smaller whole numbers (other than 1). Composite numbers are not just numerical curiosities; they are the building blocks from which all other integers greater than 1 are constructed. They are the foundation of secure communication, the subject of deep mathematical inquiry, and a testament to the elegant structure of our number system. The next time you encounter a number, take a moment to consider its nature. Is it a solitary prime, standing strong on its own? Or is it a composite number, a testament to the power of multiplication and the unique building blocks that form our numerical world? Understanding this distinction is a significant step in appreciating the beauty and utility of mathematics. They are, in essence, the "compound" numbers, ready to be broken down and understood through their prime components.**

The Definition and Essence of Composite Numbers in Mathematics Composite numbers occupy a fundamental place in number theory, serving as a cornerstone for understanding the structure and behavior of integers. At its core, a composite number is a positive whole number greater than one that is not classified as prime. This means it has more than two distinct positive divisors—specifically, numbers that can be evenly divided by integers other than one and itself. For example, while the number 5 is prime because its only divisors are 1 and 5, the number 6 is composite since it is divisible by 1, 2, 3, and 6. This distinction between prime and composite numbers reveals a deeper mathematical principle: the decomposition of integers into their multiplicative building blocks. Composite numbers, by definition, factor into smaller integers in multiple ways, a property that underpins key concepts like prime factorization and the fundamental theorem of arithmetic. This theorem states that every integer greater than one can be uniquely expressed as a product of primes, with composite numbers acting as essential intermediaries in that process. Without composite numbers, the rich tapestry of number relationships and algebraic structures would collapse into incompleteness. Beyond their theoretical role, composite numbers have practical significance across various domains. In cryptography, for instance, the difficulty of factoring large composite numbers into primes forms the backbone of widely used encryption systems such as RSA. The security of online transactions hinges on this mathematical challenge, demonstrating how abstract number theory influences modern digital life. Similarly, in computer science, understanding composite numbers aids in algorithm design, particularly in tasks involving divisibility, modular arithmetic, and optimization. Studying composite numbers also enriches mathematical education by fostering logical reasoning and pattern recognition. Learning to identify composites and explore their divisors strengthens analytical

skills, serving as a gateway to more advanced topics like modular forms, algebraic number theory, and computational complexity. Educators often use composites to illustrate concepts such as greatest common divisors, least common multiples, and number sequences, making them indispensable teaching tools. Looking ahead, the importance of composite numbers is expected to grow alongside advancements in cryptography, quantum computing, and artificial intelligence. As computational power increases, so does the urgency to develop more efficient factorization methods and secure algorithms rooted in the properties of composites. Researchers continue to probe their distribution, density, and relationships with prime numbers, seeking deeper insights that could unlock new mathematical frontiers. Ultimately, composite numbers remain not just a classification in number theory, but a vital thread connecting pure mathematics to real-world innovation.

Unveiling the Composite Number: A Deep Dive into Mathematical Definitions and Significance

In the vast and intricate landscape of mathematics, numbers are the fundamental building blocks. While some numbers possess a unique, solitary essence, others are defined by their interconnectedness and ability to be broken down. Among these, the **composite number** stands out as a key concept, offering a glimpse into the multiplicative structure of integers. Far from being a mere academic curiosity, understanding composite numbers is crucial for grasping a wide array of mathematical principles, from prime factorization to cryptography and beyond.

This comprehensive guide will meticulously explore the **definition of a composite number in math**, dissecting its core attributes, differentiating it from its arithmetical counterparts, and illuminating its pervasive significance in various mathematical fields. Whether you're a student grappling with elementary number theory or a seasoned enthusiast seeking a deeper understanding, this article aims to provide clarity and insight.

What is a Composite Number? The Core Definition

At its heart, a **composite number** is any integer greater than 1 that is not a prime number. This seemingly simple definition carries profound implications. To truly comprehend it, we must first understand its direct opposite: the prime number.

Prime Numbers: The Indivisible Building Blocks

A **prime number** is a natural number greater than 1 that has exactly two distinct positive divisors: 1 and itself. Think of them as the fundamental atoms of the number system, indivisible by any other number besides the trivial cases of 1 and themselves. Examples of prime numbers include 2, 3, 5, 7, 11, 13, and so on. The number 2 is the only even prime number, a fact that often leads to confusion but is a cornerstone of number theory.

The Composite Number: A Product of Smaller Integers

Conversely, a **composite number** is a natural number greater than 1 that has more than two distinct positive divisors. This means a composite number can be expressed as the product of two smaller positive integers, each greater than 1. In essence, composite numbers are "made up" of smaller multiplicative components.

Let's illustrate with examples:

1. **4:** The divisors of 4 are 1, 2, and 4. Since it has more than two divisors, it is a composite number. It can be expressed as 2 x 2.
2. **6:** The divisors of 6 are 1, 2, 3, and 6. It is a composite number and can be expressed as 2 x 3.
3. **9:** The divisors of 9 are 1, 3, and 9. It is a composite number and can be expressed as 3 x 3.
4. **10:** The divisors of 10 are 1, 2, 5, and 10. It is a composite number and can be expressed as 2 x 5.

It is crucial to remember that the definition explicitly states "greater than 1." This excludes the number 1 from being

classified as either prime or composite. The number 1 has only one positive divisor (itself), thus not meeting the criteria for either classification.

Key Characteristics of Composite Numbers

Beyond their fundamental definition, composite numbers exhibit several distinct characteristics that further define their nature:

Divisibility and Factors

The defining characteristic of a composite number is its divisibility by numbers other than 1 and itself. These additional divisors are often referred to as its "factors" or "proper divisors" (divisors excluding the number itself). The existence of at least one proper divisor greater than 1 is what makes a number composite.

The Role of Prime Factorization

One of the most powerful concepts associated with composite numbers is **prime factorization**. The Fundamental Theorem of Arithmetic states that every integer greater than 1 can be uniquely represented as a product of prime numbers, irrespective of the order in which the factors appear. For composite numbers, this theorem means they can be broken down into their prime building blocks.

For instance:

1. 12 = 2 x 2 x 3 (prime factors are 2 and 3)
2. 30 = 2 x 3 x 5 (prime factors are 2, 3, and 5)
3. 42 = 2 x 3 x 7 (prime factors are 2, 3, and 7)

This unique decomposition is fundamental to many areas of mathematics and computer science.

Even Numbers and Composite Numbers

It's important to note that while many even numbers are composite (e.g., 4, 6, 8, 10), the number 2 is an exception. As we established, 2 is a prime number. All other even numbers greater than 2 are composite because they are divisible by 2 in addition to 1 and themselves.

Distinguishing Composite Numbers from Other Number Types

To solidify our understanding of composite numbers, it's beneficial to differentiate them from other important categories of numbers:

Composite vs. Prime Numbers

The most direct comparison is with prime numbers. As discussed, primes have exactly two divisors (1 and themselves), while composites have more than two divisors and can be expressed as a product of smaller integers.

Composite vs. Odd Numbers

Odd numbers are integers not divisible by 2. Many odd numbers are composite (e.g., 9, 15, 21, 25), but many are also prime (e.g., 3, 5, 7, 11). The classification of odd or even does not solely determine if a number is composite.

Composite vs. Perfect Numbers

A **perfect number** is a positive integer that is equal to the sum of its proper positive divisors (divisors excluding the number itself). For example, 6 is a perfect number because its proper divisors are 1, 2, and 3, and 1 + 2 + 3 = 6. Perfect numbers are a subset of composite numbers, but not all composite numbers are perfect.

Composite vs. Abundant and Deficient Numbers

These classifications also relate to the sum of proper divisors. An **abundant number** has a sum of proper divisors greater than the number itself (e.g., 12, where 1+2+3+4+6 = 16 > 12). A **deficient number** has a sum of proper divisors less than the number itself (e.g., 8, where 1+2+4 = 7 < 8). Both abundant and deficient numbers are composite numbers, highlighting the diverse properties that can arise from their composite nature.

The Significance of Composite Numbers in Mathematics

The concept of composite numbers is far more than a simple classification; it is a cornerstone upon which much of number theory and related fields are built.

Prime Factorization and Its Applications

As mentioned, the ability to decompose composite numbers into their unique prime factors is a fundamental principle. This process, known as **prime factorization**, is essential for:

1. **Simplifying Fractions:** Finding the greatest common divisor (GCD) and least common multiple (LCM) of numbers, crucial for reducing fractions and solving algebraic equations.
2. **Cryptography:** Modern encryption algorithms, like RSA, rely on the computational difficulty of factoring very large composite numbers into their prime components. The security of online transactions and sensitive data hinges on this mathematical property.
3. **Number Theory Research:** The distribution of prime numbers and the properties of composite numbers continue to be areas of active research, driving advancements in mathematics.

Building Blocks of Other Mathematical Structures

Composite numbers are not just products; they are also foundational elements in more complex mathematical structures. For instance, in abstract algebra, concepts like rings and fields often deal with the properties of elements that can be factored, mirroring the behavior of composite numbers.

Understanding Divisibility Rules

The concept of composite numbers helps us understand and develop divisibility rules. For example, a number is divisible by 6 if and only if it is divisible by both 2 and 3. This is because 6 is a composite number (2 x 3), and if a number can be divided by its prime factors, it can also be divided by their product.

Conclusion: The Pervasive Power of Composites

In conclusion, a **composite number in math** is an integer greater than 1 that is not prime, meaning it has at least three distinct positive divisors and can be expressed as a product of two smaller positive integers. This definition, while simple, unlocks a universe of mathematical properties and applications.

From the elegant simplicity of prime factorization to the complex security protocols of the digital age, composite numbers are undeniably fundamental. They represent numbers that are "made up," hinting at the underlying structure and

interconnectedness of the integers. By understanding the definition and characteristics of composite numbers, we gain a deeper appreciation for the intricate beauty and practical utility of mathematics.

Whether you're encountering the term for the first time or revisiting its nuances, the journey into the world of composite numbers is a rewarding one, revealing the essential role these seemingly ordinary numbers play in the extraordinary realm of mathematics.

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Questions & Answers About definition of composite number in math

No	Question	Answer
1	So, what exactly *is* a composite number in math?	A composite number is a positive integer that has at least one divisor other than 1 and itself. Think of it as a number that can be 'made up' by multiplying smaller whole numbers together.
2	Is every number bigger than 1 a composite number?	No. Numbers bigger than 1 are either prime or composite. Prime numbers, like 2, 3, 5, and 7, can only be divided evenly by 1 and themselves.
3	Can you give me some easy examples of composite numbers?	Absolutely! The smallest composite number is 4 (since 2 x 2 = 4). Other examples include 6 (2 x 3), 8 (2 x 4), 9 (3 x 3), 10 (2 x 5), and 12 (2 x 6 or 3 x 4).
4	What's the difference between a composite number and a prime number?	The key difference is the number of divisors. Prime numbers have exactly two divisors (1 and themselves), while composite numbers have more than two divisors.
5	Are there any special cases for composite numbers, like 0 or 1?	Yes. By definition, composite numbers are positive integers. Therefore, 0 and 1 are neither prime nor composite. 1 has only one divisor (itself), and 0 has infinitely many divisors.
6	How can I easily tell if a number is composite?	Try dividing it by small prime numbers like 2, 3, 5, or 7. If it's divisible by any of these (or other primes less than its square root), it's composite. For instance, 15 is composite because it's divisible by 3 and 5.
7	Why is the concept of composite numbers important in mathematics?	Composite numbers are fundamental to number theory. They are crucial in understanding prime factorization (breaking down a composite number into its prime factors), which has applications in cryptography and other areas of computer science and mathematics.
8	Are there any negative composite numbers?	The definition of composite numbers typically applies to positive integers. While negative numbers can have factors, the term 'composite' is generally reserved for positive whole numbers.
9	What does it mean for a number to be 'factorable' in relation to composite numbers?	A number is factorable if it can be expressed as a product of two or more smaller positive integers. All composite numbers are factorable by definition.
10	Can a composite number be a perfect square?	Yes! Perfect squares that are greater than 1 are always composite. For example, 4 (2x2), 9 (3x3), and 16 (4x4) are all perfect squares and composite numbers.

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