

Prime and Composite Numbers

Numbers such as 2, 3, 5, 7, and 11 are prime numbers. A prime number has *only two* factors, itself and 1. A whole number that has *more than two* factors is called a composite number.

3 is an example of a prime number.
Its only factors are 1 and 3.

○ ○ ○ $1 \times 3 = 3$

8 is a composite number.
Its factors are 1, 2, 4, and 8.

○ ○ ○ ○ ○ ○ ○ ○ $1 \times 8 = 8$

○ ○ ○ ○ $2 \times 4 = 8$
○ ○ ○ ○

To find the prime factorization of a number, you can use a factor tree.

Find the prime factorization of 12.

$$\begin{array}{c}
 12 \\
 \swarrow \quad \searrow \\
 2 \times 6 \\
 \swarrow \quad \searrow \\
 2 \times 2 \times 3
 \end{array}$$

← Think of two numbers whose product is 12. You can use 2×6 or 3×4 .

← 2 is prime. ← 6 is not prime, so keep dividing.

← All the factors are prime, so you can stop dividing.

The prime factorization of 12 is $2 \times 2 \times 3$.

You can also use divisibility rules to tell whether a number is prime or composite. In the example above, 12 is an even number, so it is divisible by 2. Therefore, 12 is a composite number.

Write whether each number is prime or composite.

1. 17 _____ 2. 47 _____

Find the prime factorization.

3. 28 _____

4. **Number Sense** The prime factorization of a number is $2 \times 3 \times 3$. What is the number? _____

Name _____

Practice

4-8

Prime and Composite Numbers

Write whether each number is prime or composite.

1. 21 _____ 2. 36 _____ 3. 31 _____
4. 87 _____ 5. 62 _____ 6. 23 _____

Use factor trees to find the prime factorization of each number.

7. 44 _____ 8. 63 _____
9. 13 _____ 10. 54 _____

11. **Number Sense** Audrey says that the prime factorization of 42 is 21×2 . Is she correct? If not, tell why.

12. Is 4,564,282 prime or composite? Explain how you determined your answer.

13. Which of the following is a prime number?

A 105 **B** 27 **C** 19 **D** 9

14. **Explain It** Does it matter what two factors you select to complete a factor tree? Explain.
