

Study Guide

Prime Factorization

A whole number greater than 1 with exactly two factors, 1 and itself, is called a **prime number**.

Example 1 19 is a prime number. It has only 1 and 19 as factors.

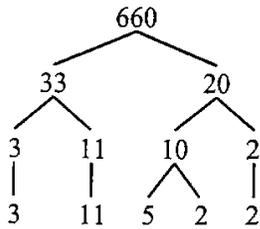
A whole number greater than 1 with more than two factors is called a **composite number**.

Example 2 18 is a composite number. It has 1, 2, 3, 6, 9, and 18 as factors.

The numbers 0 and 1 are neither prime nor composite.

A composite number may be written as the product of prime numbers. This product is the **prime factorization** of the number.

Example 3 Find the prime factorization of 660.



Write the number as the product of two factors.

Continue to factor until only prime factors remain.

The prime factorization of 660 is $3 \cdot 11 \cdot 5 \cdot 2 \cdot 2$.

Determine whether each number is prime, composite, or neither.

1. 28

2. 47

3. 39

4. 61

5. 53

6. 0

7. 159

8. 1

Find the prime factorization of each number.

9. 30

10. 155

11. 169

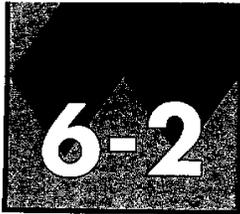
12. 100

13. 86

14. 98

15. 495

16. 40



Name _____ Date _____

Practice

Prime Factorization

Determine whether each number is prime, composite, or neither.

- | | | |
|-----------|-------|---------|
| 1. 81 | 2. 47 | 3. 61 |
| 4. 32 | 5. 23 | 6. 57 |
| 7. 17 | 8. 27 | 9. 0 |
| 10. 1,331 | 11. 1 | 12. 613 |

Find the prime factorization of each number.

- | | | |
|-----------|-----------|------------|
| 13. 60 | 14. 420 | 15. 128 |
| 16. 88 | 17. 96 | 18. 400 |
| 19. 93 | 20. 150 | 21. 84 |
| 22. 2,000 | 23. 1,760 | 24. 15,840 |