Section 8.R.2 Prime Numbers and Prime Factorizations

Go to Section 8.R.2 Learn mode in Hawkes to follow along!

Prime and Composite Numbers

Prime Number

A **prime number** is a counting number _____

_____

Composite Number

A **composite number** is _____

Determining Whether a Number is Prime

To Determine Whether a Number is Prime

Divide the number by progressively larger prime numbers (2, 3, 5, 7, 11, and so forth) until one of the following is true.

1. The remainder _____ This means that the _____

   _____

2. You find a quotient _____ This means that the _____

   _____

Example 4 Determining whether a Number is Prime

Is 103 a prime number?

Solution

Exercises

Determine whether each number is prime or composite. If the number is composite, find at least three factors of the number.

1. 59

2. 75

3. 101

4. 107

5. 205

6. 502

Finding a Prime Factorization

The Fundamental Theorem of Arithmetic

Every composite number has _____

To Find the Prime Factorization of a Composite Number

1. Factor the composite number _____

2. Factor each _____

3. Continue this process until all factors are prime.

Example 7 Finding the Prime Factorization of a Number

Find the prime factorization of 90.

Solution

Exercises

Find the prime factorization of each number. Use the tests for divisibility for 2, 3, 4, 5, 6, 9, and 10 whenever they help to find beginning factors.

7. 24

8. 36

9. 50

10. 37

11. 3500

12. 1000

Finding All Factors of a Composite Number

Factors of a Composite Number

The only factors (or divisors) of a composite number are

1. _____

2. _____

3. products formed by _____

Example 10 Finding the Factors of a Composite Number

Find all the factors of 60.

Solution

Exercises

For each number, **a.** find the prime factorization and **b.** find all the factors.

13. 18

14. 28

15. 90

16. 175

Two numbers are given. Find two factors of the first number such that their product is the first number and their sum is the second number.

17. 24, 10

18. 24, 11