

Greatest Common Factor

Factors that are shared by two or more numbers are called **common factors**. The greatest of the common factors is called the **greatest common factor** (GCF). There are several different ways to find the GCF of two or more numbers.

Example 1 Find the greatest common factor (GCF) of 56 and 104.

Method 1 List the factors of each number. Then circle the common factors.

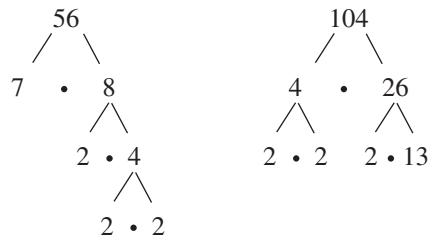
Factors of 56: ①, ②, ④, 7, ⑧, 14, 28, 56

Factors of 104: ①, ②, ④, ⑧, 13, 26, 52, 104

The common factors are 1, 2, 4, and 8. The greatest of these common factors is 8.

▶ So, the GCF of 56 and 104 is 8.

Method 2 Make a factor tree for each number.



Write the prime factorization of each number. Then circle the common prime factors. The GCF is the product of the common prime factors.

$$56 = 2 \cdot 2 \cdot 2 \cdot 7$$

$$104 = 2 \cdot 2 \cdot 2 \cdot 13$$

▶ So, the GCF of 56 and 104 is $2 \cdot 2 \cdot 2 = 8$.

Practice

Check your answers at BigIdeasMath.com.

Find the GCF of the numbers using the two methods shown above.

1. 30, 45 **15**
2. 12, 54 **6**
3. 16, 96 **16**
4. 42, 98 **14**
5. 27, 66 **3**
6. 50, 160 **10**
7. 21, 70 **7**
8. 76, 95 **19**
9. 60, 84 **12**
10. 60, 120, 210 **30**
11. 44, 64, 100 **4**
12. 15, 28, 70 **1**
13. Write a set of two numbers that have a GCF of 20. Explain how you found your answer. **20, 40**
14. Write a set of three numbers that have a GCF of 25. Explain how you found your answer. **25, 50, 75**
15. **BOUQUETS** A florist is making identical bouquets using 90 white roses, 60 red roses, and 45 pink roses. What is the greatest number of bouquets that the florist can make if no roses are left over? How many of each color are in each bouquet? **15 bouquets; 6 white, 4 red, 3 pink**
16. **FABRIC** You have two pieces of fabric. One piece is 6 feet wide and the other piece is 7.5 feet wide. You want to cut both pieces into strips of equal width that are as wide as possible. How wide should you cut the strips of fabric? **18 in.**