6.2 Greatest Common Factor (GCF)

The greatest common factor (GCF) of two or more numbers is the greatest number that is a factor of all of the numbers.

Another name for the GCF is the greatest common divisor (GCD).

There are two ways to find the GCF: make a list or use prime factorization.

Make a List

1. List all of the factors (numbers that multiply together) of each number.

2. Find the common factors.

3. Choose the greatest common factor.
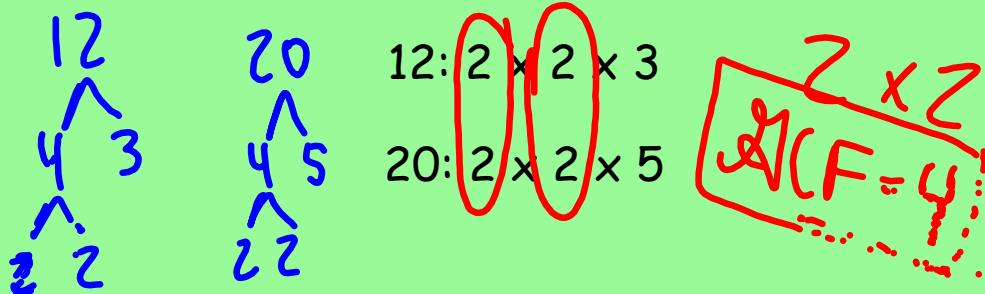
Example: Find the GCF of 12 & 20.

12: 1, 2, 3, 4, 6, 12   GCF = 4

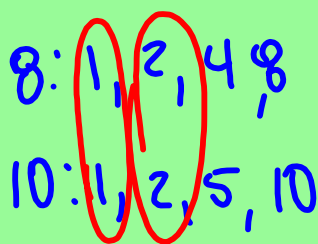20: 1, 2, 4, 5, 10, 20

Use Prime Factorization

1. Write the prime factorization of each number. You can use a factor tree.

2. Multiply the prime factors that the numbers have in common. The product is the GCF.
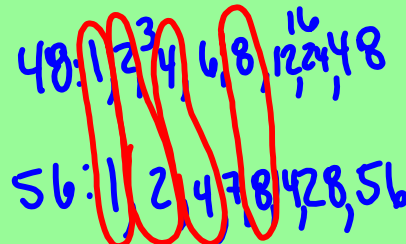
Example: Find the GCF of 12 & 20.

12: 2 × 2 × 3

20: 2 × 2 × 5

GCF = 4   2 × 2

Example: Find the GCF of each pair of numbers.

1.) 8 and 10

8: 1, 2, 4 8

10: 1, 2, 5, 10

GCF = 2

2.) 48 and 56

48: 1, 2, 3, 4, 6, 8, 12, 24, 48

56: 1, 2, 4, 7, 8, 28, 56

GCF: 8

3.) 45 & 75

45: 3 × 3 × 5

75: 3 × 5 × 5

GCF: 3×5 = 15

Example: Find the GCF of each pair of numbers.

4.) 14, 49, 70

14
2   7

49
7   7

70
7   10
       2   5
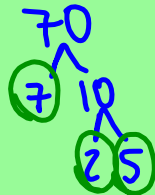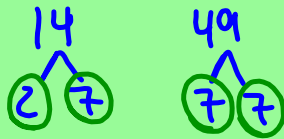
14: 2 × 7
49: 7 × 7
70: 2 × 5 × 7

$$\boxed{GCF = 7}$$

5.) 22, 66, and 110

22
2   11

66
6   11
2   3
23

110
11   10
      2   5
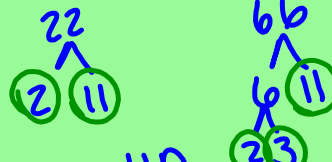
22: 2 × 11
66: 2 × 3 × 11
110: 2 × 5 × 11

$$\boxed{GCF = 2 \times 11 = 22}$$

Example: Find the pair of numbers that matches the description.

6.) between 10 and 18 that have 4 as their GCF

10 11 12 13 14 15 16 17 18

$$\boxed{12 \text{ & } 16}$$

7.) between 15 and 25 that have 8 as their GCF

15 16 17 18 19 20 21 22 23 24 25

$$\boxed{16 \text{ & } 24}$$