GREATEST COMMON FACTOR

FACT 1: The GREATEST COMMON FACTOR (GCF) is the largest factor that is shared by two or more numbers.

A factor that is common to two or more numbers is called a COMMON FACTOR.

3 is a factor common to both 18 and 12, but the largest factor common to 18 and 12 is 6. Therefore, 6 is the GCF of 18 and 12.

After 6 is factored out, the remaining numbers 3 and 2 have no common factor.

$$\frac{18}{12} = \frac{\cancel{18}^{\,3}}{\cancel{12}_{\,2}}$$

FACT 2: The GCF of two or more numbers is the product of all prime factors that can be factored out of those numbers.

The prime factors of 45 and 60 are as follows:

45 = 3 x **3** x **5**
60 = 2 x 2 x **3** x **5**

The common prime factors are **3** and **5**. Therefore, **GCF** = 3 x 5 = **15**

FACT 3: We may find the common factors and GCF of numbers by side-by-side division as follows.

Here is the side-by-side division of 45 and 60 by prime numbers that are common factors. We stop when there are no more common factors

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3 | 45, 60
5 | 15, 20
    3,  4
```

The common prime factors are **3** and **5**. Therefore, **GCF** = 3 x 5 = **15**

Example: Determine the GCF of 162, 729 and 4374.

Divide the given numbers side by side by prime factors. No more common factors can be taken out from the quotients 2, 9 and 54. The common prime factors are 3, 3, 3, and 3. Therefore,

```
3 | 162,  729,  4374
3 |  54,  243,  1458
3 |  18,   81,   486
3 |   6,   27,   162
      2,    9,    54
```

GCF = 3 x 3 x 3 x 3 **= 81**

1. Find the GCF (Greatest Common Factor) of

(a) 4 and 6
(b) 18 and 27
(c) 30 and 42
(d) 12 and 18
(e) 54 and 258
(f) 216 and 258
(g) 18, 27, and 36
(h) 162, 729 and 4374
(i) 492, 744 and 1044

Answer: 1. (a) 2 (b) 9 (c) 6 (d) 6 (e) 9 (f) 6 (g) 9 (h) 81 (i) 12

End of Lesson