Finding GCF's and LCM's and some Applications

Finding the Greatest Common Factor
of Two Numbers

We are looking for a factor. The factor must be common to both numbers. We need to pick the greatest of such common factors.

The GCF of 36 and 90

Method 1

1) List the factors of each number.

36: 1 2 3 4 6
36 18 12 9 6

90: 1 2 3 5 6 9
90 45 30 18 15 10

2) Circle the common factors.

3) The greatest of these will be your Greatest Common Factor: 18

The GCF of 36 and 90

Method 2

1) Prime factor each number.

   $36 = 2 \cdot 2 \cdot 3 \cdot 3$

   $90 = 2 \cdot 3 \cdot 3 \cdot 5$

   $2 \cdot 3 \cdot 3$

2) Circle each pair of common prime factors.

3) The product of these common prime factors will be the Greatest Common Factor:
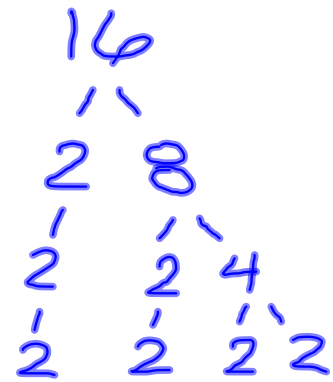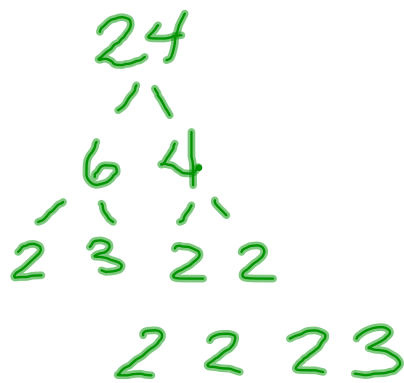
   $2 \cdot 3 \cdot 3 = 18$

36   90

GCF

24

16

24

$6 \quad 4$

$2 \quad 3 \quad 2 \quad 2$

$2 \quad 2 \quad 2 \quad 3$

16

$2 \quad 8$

$2 \quad 2 \quad 4$

$2 \quad 2 \quad 2 \quad 2$

$24: \; 2 \; 2 \; 2 \; 3$

$16: \; 2 \; 2 \; 2 \; 2$

GCF = 2×2×2

GCF = 8

12   30

Questions

1. 36
   54

   18

2. 40
   64

   8

3. 15
   40

   5

   15
   */ *
   3 5

   40
   */ *
   4   10
   */ \\ / *
   2 2 2 5

   15 : 3 5
   40 : 2 2 2 5

4. 18
   12

   6

Make a factor tree and find the GCF, ▮▮▮ and all the factors of each number.
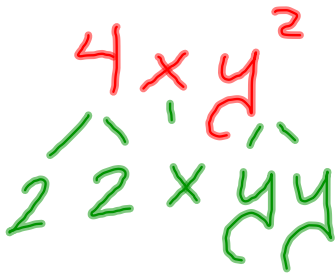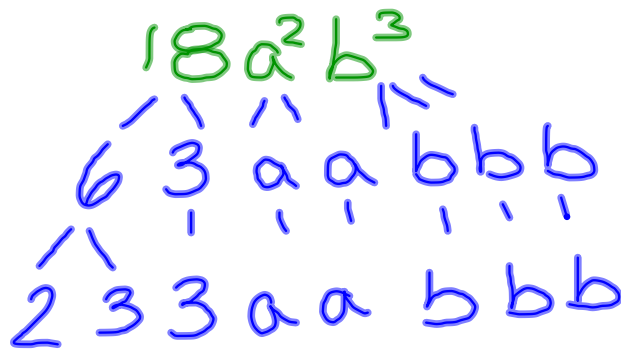
1. 40 & 60

2. 24 & 30

3. 10 & 45

4. 21 & 35

Using a factor tree, let's look at factoring polynomials. (Terms with numbers and letters)
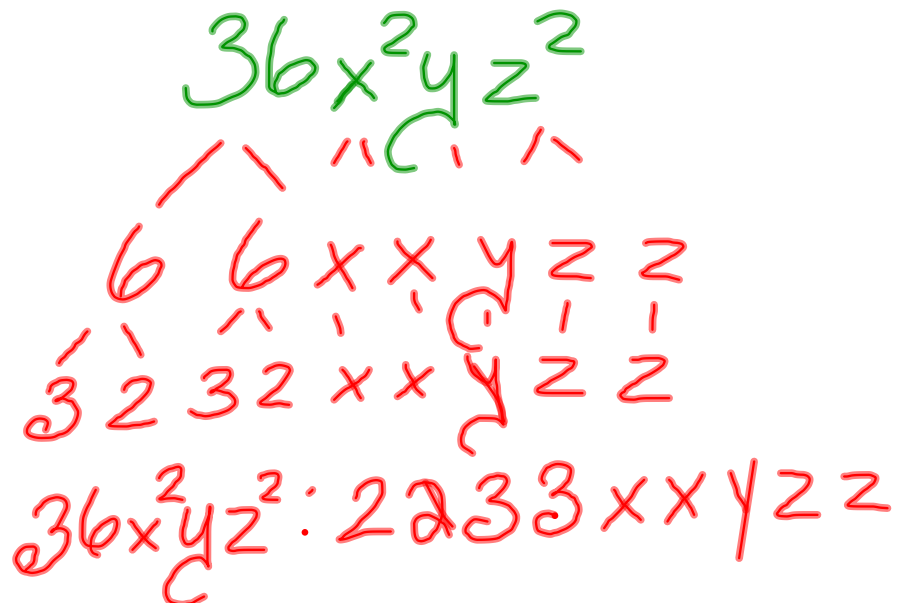
Factors

a) $4xy^2$
b) $18a^2b^3$
c) $36x^2yz^2$

$$4xy^2$$

$2 \cdot 2 \cdot x \cdot y \cdot y$

$$18a^2b^3$$

$6 \quad 3 \quad a \quad a \quad b \quad b \quad b$

$2 \cdot 3 \cdot 3 \cdot a \cdot a \cdot b \cdot b \cdot b$

$$36x^2yz^2$$

$6 \quad 6 \quad x \quad x \quad y \quad z \quad z$

$3 \cdot 2 \quad 3 \cdot 2 \quad x \cdot x \quad y \quad z \quad z$

$36x^2yz^2 : 2 \cdot 2 \cdot 3 \cdot 3 \cdot x \cdot x \cdot y \cdot z \cdot z$

GCF Between

1. $35x^2m$ and $21m^2x$

2. $36xy^3$ and $24y^2$

$36xy^3$

$6 \cdot 6 \cdot x \cdot y \cdot y \cdot y$

$2 \cdot 3 \cdot 2 \cdot 3 \cdot x \cdot y \cdot y \cdot y$

$24y^2$

$6 \cdot 4 \cdot y \cdot y$

$2 \cdot 3 \cdot 2 \cdot 2 \cdot y \cdot y$

$36xy^3: 2 \cdot 2 \cdot 3 \cdot 3 \cdot x \cdot y \cdot y \cdot y$

$24y^2: 2 \cdot 2 \cdot 2 \cdot 3 \cdot y \cdot y$

$GCF = 2 \cdot 2 \cdot 3 \cdot y \cdot y$

$GCF: 12y^2$