FACTORS

FACTORS of a particular number are numbers that divide exactly into that number.

Example: the factors of 20 are 1, 2, 4, 5, 10 and 20

Every whole number has at least 2 factors, itself and 1.

Numbers that have only 2 factors are called prime numbers. The first prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23, etc

COMMON FACTORS - Highest Common Factor (HCF)

Now we consider the factors of two separate numbers.

Some factors may be common to both numbers; these are called common factors.

Example: consider the numbers 12 and 20

the factors of 12 are 1, 2, 3, 4, 6 and 12

the factors of 20 are 1, 2, 4, 5, 10 and 20

Therefore the factors common to 12 and 20 are **1,2 and 4**.

The highest of these common factors is called the Highest Common Factor (abbreviated HCF).

So in the example above, the HCF of 12 and 20 is 4.

FACTORISING AN EXPRESSION

To factorise an expression, first take the HCF of the terms outside the brackets and divide each term by it, leaving the result in brackets.

Example 1: Factorise $10x + 15$

$10x + 15 = 5(2x+3)$ where 5 is the HCF of $10x$ and 15

Example 2: Factorise $x^2 + 4x$

$x^2 + 4x = x(x+4)$ where x is the HCF of x^2 and $4x$

To check your factorisation, expand the factorised form.

SIMPLIFYING FRACTIONS

Fractions must be simplified whenever possible, by cancelling common factors.

example 1:

$$\frac{{}^{3}\cancel{15}\,x\,\cancel{y}}{{}^{4}\cancel{20}\,\cancel{y}\,z} = \frac{3x}{4z}$$

example 2:

$$\frac{10ab}{15bc} = \frac{{}^{2}\cancel{10}\times a\times \cancel{b}}{{}^{3}\cancel{15}\times \cancel{b}\times c} = \frac{2a}{3c}$$

example 3:

$$\frac{18x^2y}{8xz} = \frac{{}^{9}\cancel{18}\times \cancel{x}\times x\times y}{{}^{4}\cancel{8}\times \cancel{x}\times z} = \frac{9xy}{4z}$$