

**Example 6****Self Tutor**

Express 252 as the product of prime factors.

$$\begin{array}{r|l}
 2 & 252 \\
 2 & 126 \\
 3 & 63 \\
 3 & 21 \\
 7 & 7 \\
 & 1
 \end{array}$$

$$\begin{aligned}
 \therefore 252 &= 2 \times 2 \times 3 \times 3 \times 7 \\
 &= 2^2 \times 3^2 \times 7
 \end{aligned}$$



We divide by primes until we are left with 1. We usually write the result in exponent form.

**Example 7****Self Tutor**

Find the highest common factor (HCF) of 18 and 24.

$$\begin{array}{r|l}
 2 & 18 \\
 3 & 9 \\
 3 & 3 \\
 & 1
 \end{array}$$

$$\begin{array}{r|l}
 2 & 24 \\
 2 & 12 \\
 2 & 6 \\
 3 & 3 \\
 & 1
 \end{array}$$

$$18 = 2 \times 3 \times 3$$

$$24 = 2 \times 2 \times 2 \times 3$$

$2 \times 3$  is common to the factorisations of both 18 and 24.

So, the highest common factor of 18 and 24 is  $2 \times 3 = 6$ .

**Example 8****Self Tutor**

Find common multiples of 4 and 6 between 20 and 40.

The multiples of 4 are 4, 8, **12**, 16, 20, **24**, 28, 32, **36**, 40, ...

The multiples of 6 are 6, **12**, 18, **24**, 30, **36**, 42, ...

$\therefore$  the common multiples between 20 and 40 are 24 and 36.

**Example 9****Self Tutor**

Find the lowest common multiple of 9 and 12.

The multiples of 9 are: 9, 18, 27, **36**, 45, 54, 63, **72**, 81, ...

The multiples of 12 are: 12, 24, **36**, 48, 60, **72**, 84, ...

$\therefore$  the common multiples are 36, 72, ... and 36 is the smallest of these

$\therefore$  the LCM is 36.