

# Be Wizard At Maths



**I don't usually make jokes about fractions...  
...but I will make one if I halve two.**

## 2.1 Lowest Common Multiple

The multiples of 6 are the numbers that are in the 6 times table.

$$1 \times 6 = 6$$

$$2 \times 6 = 12$$

$$3 \times 6 = 18$$

$$4 \times 6 = 24$$

$$5 \times 6 = 30$$

$$6 \times 6 = 42$$

$$7 \times 6 = 48$$

$$\dots \times \dots = \dots$$

$$\{ \text{Multiples of } 6 \} = \{ 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, \dots \}$$

The multiples of 15 are the numbers that are in the 15 times table.

$$1 \times 15 = 15$$

$$2 \times 15 = 30$$

$$3 \times 15 = 45$$

$$\dots \times \dots = \dots$$

$$\{ \text{Multiples of } 15 \} = \{ 15, 30, 45, \dots \}$$

The **lowest common multiple** of 6 and 15 is the first integer that is in the 6 times table and also in the 15 times table

$$\text{lcm}\{6,15\} = 30$$

This is the key to adding awkward fractions which have awkward denominators.

For example,  $\frac{1}{6} + \frac{4}{15}$

The trick is to work out the **lowest common multiple** of the denominators and then use the multiplying by 1 technique on **both** pieces of the fraction sum.

$$\begin{aligned}\frac{1}{6} + \frac{4}{15} &= \frac{1}{6} \times 1 + \frac{4}{15} \times 1 && \text{Step 1: Multiply by 1} \\ &= \frac{1}{6} \times \frac{5}{5} + \frac{4}{15} \times \frac{2}{2} && \text{Step 2: Use lcm}\{6,15\} \text{ is 30} \\ &= \frac{5}{30} + \frac{8}{30} && \text{Step 3: Do the two multiplications} \\ &= \frac{13}{30} && \text{Step 4: Do the easy addition}\end{aligned}$$

The **lowest common multiple** when used in this way is often called the **lowest common denominator**

## 2.2 Exercise

Marks Available : 40

### Question 1

(i) List the first six multiples of 8

[ 1 mark ]

(ii) List the first six multiples of 12

[ 1 mark ]

(iii) What is  $\text{lcm}\{8,12\}$  ?

[ 1 mark ]

(iv) Showing all the steps, work out  $\frac{3}{8} + \frac{5}{12}$

[ 7 marks ]

**Question 2**

(i) List the first six multiples of 10 [ 1 mark ]

(ii) List the first six multiples of 25 [ 1 mark ]

(iii) What is  $lcm\{10,25\}$  ? [ 1 mark ]

(iv) Showing all the steps, work out  $\frac{3}{10} + \frac{7}{25}$

[ 7 marks ]

**Question 3**

(i) List the first ten multiples of 9 [ 1 mark ]

(ii) List the first six multiples of 24 [ 1 mark ]

(iii) What is  $lcm\{9,24\}$  ? [ 1 mark ]

(iv) Showing all the steps, work out  $\frac{2}{9} + \frac{7}{24}$

[ 7 marks ]

**Question 4**

(i) List the first eight multiples of 12 [ 1 mark ]

(ii) List the first eight multiples of 14 [ 1 mark ]

(iii) What is  $lcm\{12,14\}$  ? [ 1 mark ]

(iv) Showing all the steps, work out  $\frac{5}{12} - \frac{1}{14}$  [ 7 marks ]



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In October 2020, Shrewsbury School was voted “**Independent School of the Year 2020**”

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Teachers may obtain detailed worked solutions to the exercises by email from [mhh@shrewsbury.org.uk](mailto:mhh@shrewsbury.org.uk)