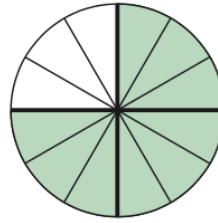
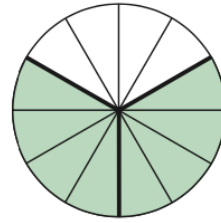


Compare  $\frac{3}{4}$  and  $\frac{2}{3}$ .

If we think about cutting a cake into these fractions, then dividing each fraction into smaller pieces of the same size, we have:



$$\frac{3}{4} = \frac{9}{12}$$



$$\frac{2}{3} = \frac{8}{12}$$

and the comparison is easier as  $\frac{9}{12}$  is greater than  $\frac{8}{12}$ , so,  $\frac{3}{4}$  is greater than  $\frac{2}{3}$ .

## LOWEST COMMON DENOMINATORS

We convert the fractions to fractions with a common (same) denominator. The common denominator is the lowest common multiple of the original denominators. This denominator is called the **lowest common denominator (LCD)**.

**LCD** is the abbreviation for **Lowest Common Denominator**.



### Example 12

Find the LCD of  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$  by first finding the lowest common multiple of 2, 3, and 4.

Multiples of 2 are 2 4 6 8 10 **12** 14 16 18 20 22 **24**

Multiples of 3 are 3 6 9 **12** 15 18 21 **24**

Multiples of 4 are 4 8 **12** 16 20 **24**

The common multiples of 2, 3 and 4 are ; 12, 24, 36, etc.

The lowest common multiple is 12.

So, the LCD of  $\frac{1}{2}$ ,  $\frac{1}{3}$  and  $\frac{1}{4}$  is 12.

## EXERCISE 61

1 Find the lowest common multiple of

**a** 2 and 4

**b** 6 and 12

**c** 6 and 8

**d** 5 and 3

**e** 4 and 7

**f** 10 and 15

**g** 7 and 9

**h** 8 and 12

**i** 3, 6 and 9

**j** 4, 5 and 10

**k** 3, 4 and 5

**l** 4, 5 and 6

2 Find the lowest common denominator of

**a**  $\frac{1}{4}$  and  $\frac{5}{8}$

**b**  $\frac{2}{3}$  and  $\frac{3}{4}$

**c**  $\frac{5}{9}$  and  $\frac{3}{4}$

**d**  $\frac{4}{7}$  and  $\frac{5}{9}$

**Example 13**

Write  $\frac{5}{9}$  and  $\frac{4}{7}$  with lowest common denominator (LCD) and hence find which fraction is greater.

The lowest common multiple of 9 and 7 is 63.

So, LCD of  $\frac{5}{9}$  and  $\frac{4}{7}$  is 63.

$$\text{So } \frac{5}{9} = \frac{5 \times 7}{9 \times 7} = \frac{35}{63} \quad \text{and} \quad \frac{4}{7} = \frac{4 \times 9}{7 \times 9} = \frac{36}{63}.$$

As  $\frac{36}{63}$  is greater than  $\frac{35}{63}$ , then  $\frac{4}{7}$  is greater than  $\frac{5}{9}$ .

- 3** Write each set of fractions with the lowest common denominator and hence find which fraction is the larger:

**a**  $\frac{4}{7}$  and  $\frac{5}{8}$

**b**  $\frac{3}{8}$  and  $\frac{4}{9}$

**c**  $\frac{5}{6}$  and  $\frac{7}{8}$

**d**  $\frac{3}{10}$  and  $\frac{4}{15}$

- 4** Write each set of fractions with the lowest common denominator and hence list the three fractions in order of size from smallest to largest (i.e., in ascending order):

**a**  $\frac{2}{3}, \frac{3}{4}, \frac{7}{12}$

**b**  $\frac{2}{3}, \frac{5}{6}, \frac{7}{12}$