

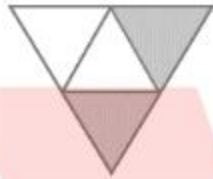
CBSE NCERT Solutions for Class 6 Mathematics Chapter 7

Back of Chapter Questions

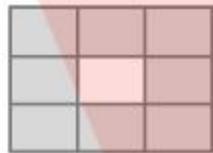
Exercise 7.1

1. Write the fraction representing the shaded portion.

(A)



(B)



(C)



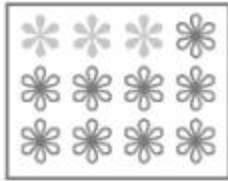
(D)



(E)



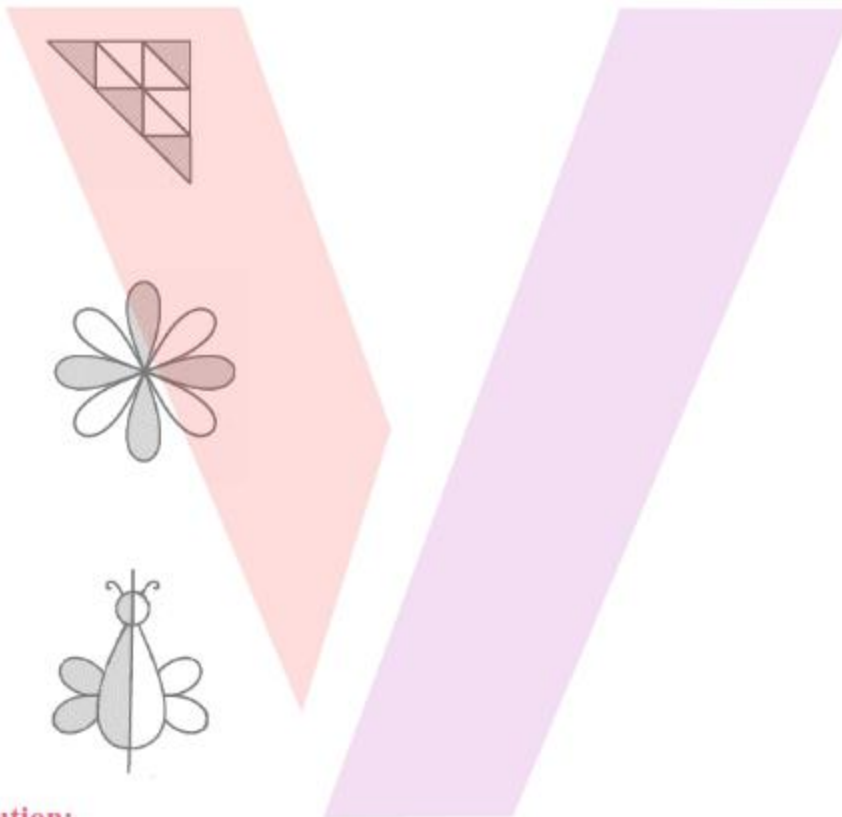
(F)



(G)



(H)



(I)



(J)



Solution:

We know that a fraction is a number representing part of a whole.

Here, the numerator represents the number of parts shaded. The denominator represents the number of equal parts into which the whole figure has been divided.

Therefore, the required fraction = $\frac{\text{Number of parts shaded}}{\text{Total number of equal parts}}$

(A) The given figure is divided into four equal parts out of which two parts have been shaded.

\therefore Total number of boxes = 4

Total number of boxes shaded = 2

Therefore, the required fraction = $\frac{\text{Total number of boxes shaded}}{\text{Total number of boxes}} = \frac{2}{4}$

Hence, the required fraction is $\frac{2}{4}$

- (B) The given figure is divided into nine equal parts out of which eight parts have been shaded.

∴ Total number of boxes = 9

Total number of boxes shaded = 8

Therefore, the required fraction = $\frac{\text{Total number of boxes shaded}}{\text{Total number of boxes}} = \frac{8}{9}$

Hence, the required fraction is $\frac{8}{9}$

- (C) The given figure has eight equal parts out of which four parts have been shaded.

∴ Total number of parts = 8

Total number of parts shaded = 4

Therefore, the required fraction = $\frac{\text{Total number of parts shaded}}{\text{Total number of parts}} = \frac{4}{8}$

Hence, the required fraction is $\frac{4}{8}$

- (D) The given figure is divided into four equal parts out of which one part has been shaded.

∴ Total number of parts = 4

Total number of parts shaded = 1

Therefore, the required fraction = $\frac{\text{Total number of parts shaded}}{\text{Total number of parts}} = \frac{1}{4}$

Hence, the required fraction is $\frac{1}{4}$

- (E) The given figure is divided into seven equal parts out of which three parts have been shaded.

∴ Total number of boxes = 7

Total number of boxes shaded = 3

Therefore, the required fraction = $\frac{\text{Total number of boxes shaded}}{\text{Total number of boxes}} = \frac{3}{7}$

Hence, the required fraction is $\frac{3}{7}$

- (F) The given figure is divided into 12 equal parts out of which three parts have been shaded.

$$\therefore \text{Total number of flowers} = 12$$

$$\text{Total number of flowers shaded} = 3$$

$$\text{Therefore, the required fraction} = \frac{\text{Total number of flowers shaded}}{\text{Total number of flowers}} = \frac{3}{12}$$

$$\text{Hence, the required fraction is } \frac{3}{12}$$

- (G) The given figure is divided into 10 equal parts out of which 10 parts have been shaded.

$$\therefore \text{Total number of pencils} = 10$$

$$\text{Total number of pencils shaded} = 10$$

$$\text{Therefore, the required fraction} = \frac{\text{Total number of pencils shaded}}{\text{Total number of pencils}} = \frac{10}{10}$$

$$\text{Hence, the required fraction is } \frac{10}{10}$$

- (H) The given figure is divided into nine equal parts out of which four parts have been shaded.

$$\therefore \text{Total number of triangles} = 9$$

$$\text{Total number of triangles shaded} = 4$$

$$\text{Therefore, the required fraction} = \frac{\text{Total number of triangles shaded}}{\text{Total number of triangles}} = \frac{4}{9}$$

$$\text{Hence, the required fraction is } \frac{4}{9}$$

- (I) The given figure is divided into eight equal parts out of which four parts have been shaded.

$$\therefore \text{Total number of petals} = 8$$

$$\text{Total number of petals shaded} = 4$$

$$\text{Therefore, the required fraction} = \frac{\text{Total number of petals shaded}}{\text{Total number of petals}} = \frac{4}{8}$$

$$\text{Hence, the required fraction is } \frac{4}{8}$$

- (J) The given figure is divided into two equal parts out of which one part has been shaded.

$$\therefore \text{Total number of parts} = 2$$

$$\text{Total number of parts shaded} = 1$$

Therefore, the required fraction = $\frac{\text{Total number of parts shaded}}{\text{Total number of parts}} = \frac{1}{2}$

Hence, the required fraction is $\frac{1}{2}$

2. Color the part according to the given fraction.

(A) $\frac{1}{6}$



(B) $\frac{1}{4}$



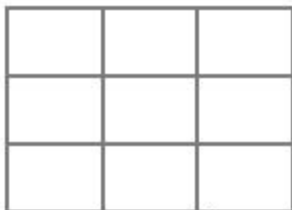
(C) $\frac{1}{3}$



(D) $\frac{3}{4}$



(E) $\frac{4}{9}$



Solution:

We know that a fraction is a number representing part of a whole.

Here, the numerator represents the number of parts to be shaded. The denominator represents the number of equal parts into which the whole figure has been divided.

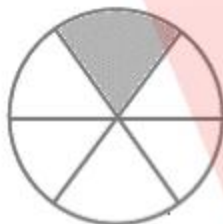
Therefore, the given fraction = $\frac{\text{Number of parts to be shaded}}{\text{Total number of equal parts}}$

- (A) The given fraction is $\frac{1}{6}$ which implies one part is to be shaded out of six equal parts of the figure.

$$\text{The given fraction} = \frac{\text{Total number of parts shaded}}{\text{Total number of parts}} = \frac{1}{6}$$

$$\therefore \text{Total number of parts} = 6$$

$$\text{Total number of parts to be shaded} = 1$$



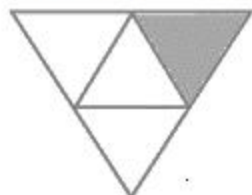
Hence, the above figure is the required answer.

- (B) The given fraction is $\frac{1}{4}$ which implies one part is to be shaded out of four equal parts of the figure.

$$\text{The given fraction} = \frac{\text{Total number of parts shaded}}{\text{Total number of parts}} = \frac{1}{4}$$

$$\therefore \text{Total number of parts in the given figure} = 4$$

$$\text{Total number of parts to be shaded} = 1$$



Hence, the above figure is the required answer.

- (C) The given fraction is $\frac{1}{3}$ which implies one part is to be shaded out of three equal parts of the figure.

$$\text{The given fraction} = \frac{\text{Total number of parts shaded}}{\text{Total number of parts}} = \frac{1}{3}$$

∴ Total number of parts in the given figure = 3

Total number of parts to be shaded = 1



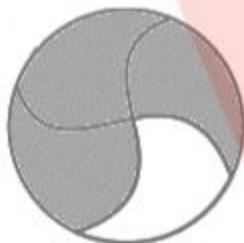
Hence, the above figure is the required answer.

- (D) The given fraction is $\frac{3}{4}$ which implies three parts are to be shaded out of four equal parts of the figure.

$$\text{The given fraction} = \frac{\text{Total number of parts shaded}}{\text{Total number of parts}} = \frac{3}{4}$$

∴ Total number of parts = 4

Total number of parts to be shaded = 3



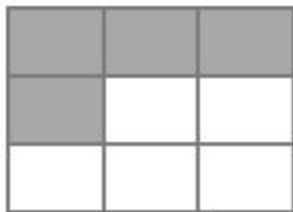
Hence, the above figure is the required answer.

- (E) The given fraction is $\frac{4}{9}$ which implies four parts are to be shaded out of nine equal parts of the figure.

$$\text{The given fraction} = \frac{\text{Total number of parts shaded}}{\text{Total number of parts}} = \frac{4}{9}$$

∴ Total number of boxes = 9

Total number of boxes to be shaded = 4



Hence, the above figure is the required answer.

3. Identify the error, if any.



This is $\frac{1}{2}$.



This is $\frac{1}{4}$.



This is $\frac{3}{4}$.

Solution:

We know that a fraction is a number representing part of a whole.

It is essential that the whole is divided into equal number of parts.

However, from the given figures, it is clear that they are not equally divided.

Hence, the given fractions are incorrect.

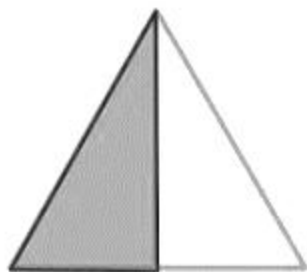
Therefore, the proper representation is as follows:

The given fraction is $\frac{1}{2}$ which implies one part is to be shaded out of two equal parts of the figure.

$$\text{The given fraction} = \frac{\text{Total number of parts shaded}}{\text{Total number of parts}} = \frac{1}{2}$$

∴ Total number of parts=2

Total number of parts to be shaded=2



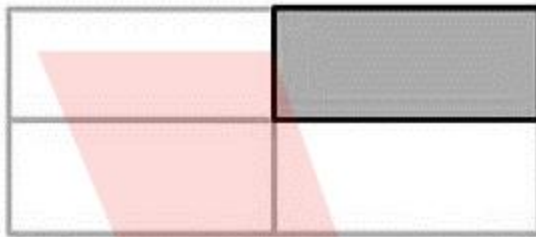
Therefore, this represents $\frac{1}{2}$

The given fraction is $\frac{1}{4}$ which implies one part is to be shaded out of four equal parts of the figure.

$$\text{The given fraction} = \frac{\text{Total number of parts shaded}}{\text{Total number of parts}} = \frac{1}{4}$$

∴ Total number of parts=4

Total number of parts to be shaded=1



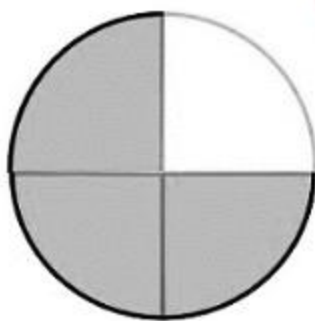
Therefore, this represents $\frac{1}{4}$.

The given fraction is $\frac{3}{4}$ which implies three parts are to be shaded out of four equal parts of the figure.

$$\text{The given fraction} = \frac{\text{Total number of parts shaded}}{\text{Total number of parts}} = \frac{3}{4}$$

∴ Total number of parts=4

Total number of parts to be shaded=3



Therefore, this represents $\frac{3}{4}$

4. What fraction of a day is 8 hours?

Solution:

Since a day is equally divided into 24 hours, and out of which we need to represent 8 hours, the fraction will be

$$\frac{\text{Number of hours}}{\text{Total number of hours in a day}} = \frac{8}{24} = \frac{1}{3}$$

Hence, the required fraction is $\frac{1}{3}$

5. What fraction of an hour is 40 minutes?

Solution:

Since an hour is equally divided into 60 minutes, and out of which we are to represent 40 minutes, the fraction will be

$$\frac{\text{Number of minutes}}{\text{Total number minutes in an hour}} = \frac{40}{60} = \frac{2}{3}$$

Hence, the required fraction is $\frac{2}{3}$

6. Arya, Abhimanyu, and Vivek shared lunch. Arya has brought two sandwiches, one made of vegetable and one of jam. The other two boys forgot to bring their lunch. Arya agreed to share his sandwiches so that each person will have an equal share of each sandwich.

- (A) How can Arya divide his sandwiches so that each person has an equal share?
 (B) What part of a sandwich will each boy receive?

Solution:

Arya will have to divide each sandwich into three equal parts and give one part of each sandwich to each one of them.

$$\text{The required fraction} = \frac{\text{Number of parts each of them receive}}{\text{Total number of equal parts}} = \frac{1}{3}$$

7. Kanchan dyes dresses. She had to dye 30 dresses. She has so far finished 20 dresses.

What fraction of dresses has she finished?

Solution:

Given,

Total number of dresses = 30

Number of dresses finished = 20

$$\text{Fraction of finished work} = \frac{\text{Number of dresses finished}}{\text{Total number of dresses}} = \frac{20}{30} = \frac{2}{3}$$

Therefore, she has dyed $\frac{2}{3}$ of dresses so far.

8. Write the natural numbers from 2 to 12. What fraction of them are prime numbers?

Solution:

The natural numbers from 2 to 12 are as follows:

$$2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 = 11$$

Out of these, the prime numbers are as follows:

$$2, 3, 5, 7, 11 = 5$$

$$\text{Now, the required fraction} = \frac{\text{Count of prime numbers in the given range}}{\text{Count of natural numbers in the given range}} = \frac{5}{11}$$

Hence, the fraction for the above prime numbers is $\frac{5}{11}$

9. Write the natural numbers from 102 to 113. What fraction of them are prime numbers?

Solution:

The natural numbers from 102 to 113 are as follows:
102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113 = 12

Out of these, the prime numbers are as follows: 103, 107, 109, 113 = 4

$$\text{Now, the required fraction} = \frac{\text{Count of prime numbers in the given range}}{\text{Count of natural numbers in the given range}} = \frac{4}{12} = \frac{1}{3}$$

Hence, the fraction for the above prime numbers is $\frac{1}{3}$

10. What fraction of these circles have X's in them?



Solution:

Given,

Total number of circles = 8

Number of circles having 'X' = 4

$$\therefore \text{The required fraction} = \frac{\text{Number of fractions having X in them}}{\text{Total number of fractions}} = \frac{4}{8}$$

Hence, the fraction of these circles is $\frac{4}{8}$

11. Kristin received a CD player for her birthday. She bought 3 CDs and received 5 others as gifts. What fraction of her total CDs did she buy and what fraction did she receive as gifts?

Solution:

Given,

$$\text{Total number of CDs} = 3 + 5 = 8$$

$$\text{Number of CDs purchased} = 3$$

$$\text{Fraction of CDs purchased} = \frac{\text{Number of CDs purchased}}{\text{Total number of CDs}} = \frac{3}{8}$$

$$\text{Fraction of CDs received as gifts} = \frac{\text{Number of CDs received as gifts}}{\text{Total number of CDs}} = \frac{5}{8}$$

Therefore, Kristin purchased and received CDs in the fraction of $\frac{3}{8}$ and $\frac{5}{8}$ respectively.

Exercise 7.2

1. Draw number lines and locate the points on them:

(A) $\frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{4}{4}$

(B) $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{7}{8}$

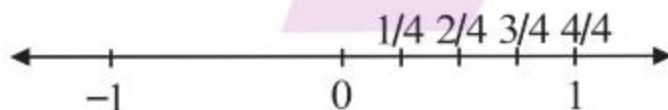
(C) $\frac{2}{5}, \frac{3}{5}, \frac{8}{5}, \frac{4}{5}$

Solution:

(A) Given, $\frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{4}{4}$

These points lie between 0 and 1.

The distance between 0 and 1 is divided equally into four parts.

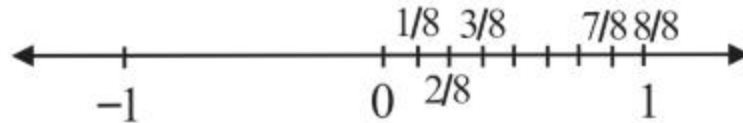


Therefore, the given points are located on the above number line.

(B) Given, $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{7}{8}$

These points lie between 0 and 1.

The distance between 0 and 1 is divided equally into eight parts.



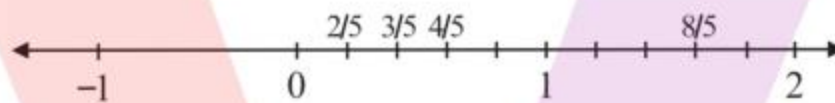
Therefore, the given points are located on the above number line.

(C) Given, $\frac{2}{5}, \frac{3}{5}, \frac{8}{5}, \frac{4}{5}$

Since, $\frac{8}{5} > 1$ it is not possible to represent eight parts out of five.

These points lie between 0 and 2.

Hence, we divide the distance between 0 and 2 equally into eight parts.



Therefore, the given points are located on the above number line.

2. Express the following as mixed fractions:

(A) $\frac{20}{3}$

(B) $\frac{11}{5}$

(C) $\frac{17}{7}$

(D) $\frac{28}{5}$

(E) $\frac{19}{6}$

(F) $\frac{35}{9}$

Solution:

Given, an improper fraction, the mixed fraction is represented as follows:

$$\text{Quotient} \frac{\text{Remainder}}{\text{Divisor}}$$

Note that the denominator divides the numerator.

(A) Given, $\frac{20}{3}$

$$\begin{array}{r} 3 \overline{) 20} \\ \underline{-18} \\ 2 \end{array}$$

$$\therefore \frac{20}{3} = 6\frac{2}{3}$$

Hence, the required fraction is $6\frac{2}{3}$

(B) Given, $\frac{11}{5}$

$$\begin{array}{r} 5 \overline{) 11} \\ \underline{-10} \\ 1 \end{array}$$

$$\therefore \frac{11}{5} = 2\frac{1}{5}$$

Hence, the required fraction is $2\frac{1}{5}$

(C) Given, $\frac{17}{7}$

$$\begin{array}{r} 7 \overline{) 17} \\ \underline{-14} \\ 3 \end{array}$$

$$\therefore \frac{17}{7} = 2\frac{3}{7}$$

Hence, the required fraction is $2\frac{3}{7}$

(D) Given, $\frac{28}{5}$

$$\begin{array}{r} 5 \overline{) 28} \\ \underline{-25} \\ 3 \end{array}$$

$$\therefore \frac{28}{5} = 5\frac{3}{5}$$

Hence, the required fraction is $5\frac{3}{5}$

(E) Given, $\frac{19}{6}$

$$\begin{array}{r} 3 \\ 6 \overline{) 19} \\ \underline{-18} \\ 1 \end{array}$$

$$\therefore \frac{19}{6} = 3\frac{1}{6}$$

Hence, the required fraction is $3\frac{1}{6}$

(F) Given, $\frac{35}{9}$

$$\begin{array}{r} 3 \\ 9 \overline{) 35} \\ \underline{-27} \\ 8 \end{array}$$

$$\therefore \frac{35}{9} = 3\frac{8}{9}$$

Hence, the required fraction is $3\frac{8}{9}$

3. Express the following as improper fractions:

(A) $7\frac{3}{4}$

(B) $5\frac{6}{7}$

(C) $2\frac{5}{6}$

(D) $10\frac{3}{5}$

(E) $9\frac{3}{7}$

(F) $8\frac{4}{9}$

Solution:

Given a mixed fraction, the improper fraction is obtained as follows:

$$\frac{(\text{Whole} \times \text{Denominator}) + \text{Numerator}}{\text{Denominator}}$$

(A) Given, $7\frac{3}{4}$

$$\begin{aligned} 7\frac{3}{4} &= \frac{(7 \times 4) + 3}{4} \\ &= \frac{28 + 3}{4} = \frac{31}{4} \end{aligned}$$

Hence, the required improper fraction is $\frac{31}{4}$

(B) Given, $5\frac{6}{7}$

$$\begin{aligned} 5\frac{6}{7} &= \frac{(5 \times 7) + 6}{7} \\ &= \frac{35 + 6}{7} = \frac{41}{7} \end{aligned}$$

Hence, the required improper fraction is $\frac{41}{7}$

(C) Given, $2\frac{5}{6}$

$$\begin{aligned} 2\frac{5}{6} &= \frac{(2 \times 6) + 5}{6} \\ &= \frac{12 + 5}{6} = \frac{17}{6} \end{aligned}$$

Hence, the required improper fraction is $\frac{17}{6}$

(D) Given, $10\frac{3}{5}$

$$\begin{aligned} 10\frac{3}{5} &= \frac{(10 \times 5) + 3}{5} \\ &= \frac{50 + 3}{5} = \frac{53}{5} \end{aligned}$$

Hence, the required improper fraction is $\frac{53}{5}$

(E) Given, $9\frac{3}{7}$

$$\begin{aligned} 9\frac{3}{7} &= \frac{(9 \times 7) + 3}{7} \\ &= \frac{63 + 3}{7} = \frac{66}{7} \end{aligned}$$

Hence, the required improper fraction is $\frac{66}{7}$

(F) Given, $8\frac{4}{9}$

$$8\frac{4}{9} = \frac{(8 \times 9) + 4}{9}$$

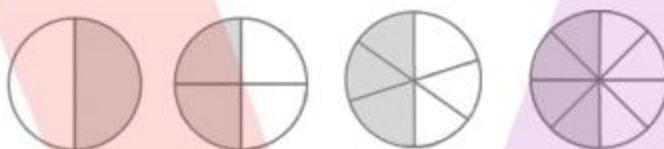
$$= \frac{72 + 4}{9} = \frac{76}{9}$$

Hence, the required improper fraction is $\frac{76}{9}$

Exercise 7.3

1. Write the fractions. Are all these fractions equivalent?

(A)



(B)



Solution:

(A) From the given figure,

The required fraction is written as $\frac{\text{Number of parts shaded}}{\text{Total number of equal parts}}$

Therefore, the fractions are: $\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \frac{4}{8}$

We can observe that,

$$\frac{2}{4} = \frac{1 \times 2}{2 \times 2}$$

$$\frac{3}{6} = \frac{1 \times 3}{2 \times 3}$$

$$\frac{4}{8} = \frac{1 \times 4}{2 \times 4}$$

Clearly, $\frac{2}{4}, \frac{3}{6}, \frac{4}{8}$ are multiples of $\frac{1}{2}$. They are obtained by multiplying the numerator and the denominator of $\frac{1}{2}$ by the same number.

Therefore, the given fractions are equivalent.

(B) From the given figure,

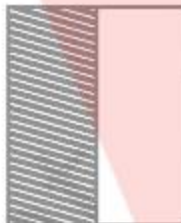
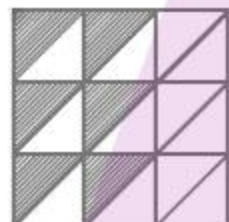



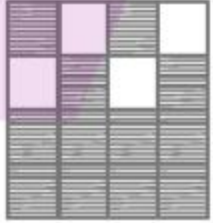
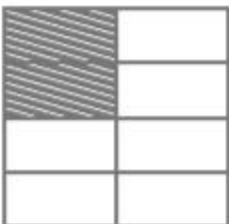
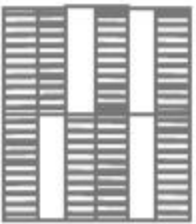
The required fraction is written as $\frac{\text{Number of parts shaded}}{\text{Total number of equal parts}}$

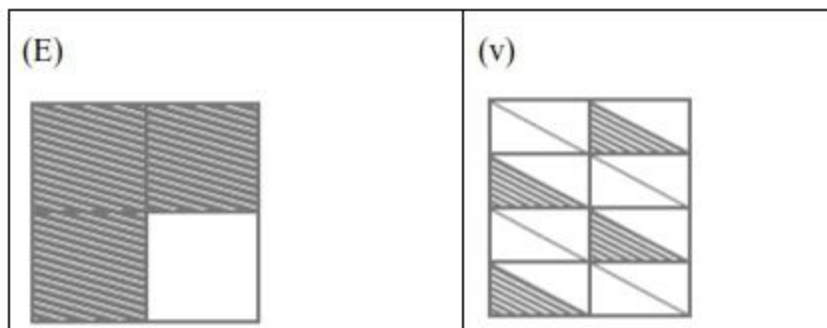
Therefore, the fractions are: $\frac{4}{12}, \frac{3}{9}, \frac{2}{6}, \frac{1}{3}, \frac{6}{15}$

Clearly, these fractions cannot be obtained by multiplying the numerator and the denominator of a fraction by the same number.

Therefore, the obtained fractions are not equivalent.

2. Write the fractions and pair up the equivalent fractions from each row.

<p>(A)</p> 	<p>(i)</p> 
<p>(B)</p> 	<p>(ii)</p> 
<p>(C)</p> 	<p>(iii)</p> 
<p>(D)</p> 	<p>(iv)</p> 



Solution:

The required fraction = $\frac{\text{Number of parts shaded}}{\text{Total number of equal parts}}$

An equivalent fraction is obtained by multiplying or dividing both the numerator and denominator of a given fraction.

The table below shows the pairs from the two sets that have equivalent fractions:

(A) From the given figure,

The required fraction is $\frac{1}{2}$

(B) From the given figure,

$$\frac{4}{6} = \frac{4 \div 2}{6 \div 2} = \frac{2}{3}$$

Hence, the required fraction is $\frac{2}{3}$

(C) From the given figure,

$$\frac{3}{9} = \frac{3 \div 3}{9 \div 3} = \frac{1}{3}$$

Hence, the required fraction is $\frac{1}{3}$

(D) From the given figure,

$$\frac{2}{8} = \frac{2 \div 2}{8 \div 2} = \frac{1}{4}$$

Hence, the required fraction is $\frac{1}{4}$

(E) From the given figure,

The required fraction is $\frac{3}{4}$

(i) From the given figure,

$$\frac{6}{18} = \frac{6 \div 6}{18 \div 6} = \frac{1}{3}$$

Hence, the required fraction is $\frac{1}{3}$

(ii) From the given figure,

$$\frac{4}{8} = \frac{4 \div 4}{8 \div 4} = \frac{1}{2}$$

Hence, the required fraction is $\frac{1}{2}$

(iii) From the given figure,

$$\frac{12}{16} = \frac{12 \div 4}{16 \div 4} = \frac{3}{4}$$

Hence, the required fraction is $\frac{3}{4}$

(iv) From the given figure,

$$\frac{8}{12} = \frac{8 \div 4}{12 \div 4} = \frac{2}{3}$$

Hence, the required fraction is $\frac{2}{3}$

(v) From the given figure,

$$\frac{4}{16} = \frac{4 \div 4}{16 \div 4} = \frac{1}{4}$$

Hence, the required fraction is $\frac{1}{4}$

Now, let us pair up the equivalent fractions as shown below:

(A) $\frac{1}{2}$	(ii) $\frac{1}{2}$
(B) $\frac{2}{3}$	(iv) $\frac{2}{3}$
(C) $\frac{1}{3}$	(i) $\frac{1}{3}$
(D) $\frac{1}{4}$	(v) $\frac{1}{4}$
(E) $\frac{3}{4}$	(iii) $\frac{3}{4}$

3. Replace \square in each of the following by the correct number:

(A) $\frac{2}{7} = \frac{8}{\square}$

(B) $\frac{5}{8} = \frac{10}{\square}$

(C) $\frac{3}{5} = \frac{\square}{20}$

(D) $\frac{45}{60} = \frac{15}{\square}$

(E) $\frac{18}{24} = \frac{\square}{4}$

Solution:

By the concept of equivalent fractions, we have

(A) Numerator of 8 is obtained by multiplying the given fraction by 4.

$$\frac{2}{7} = \frac{2 \times 4}{7 \times 4} = \frac{8}{28}$$

Therefore, the required answer is 28

(B) Numerator of 10 is obtained by multiplying the given fraction by 2.

$$\frac{5}{8} = \frac{5 \times 2}{8 \times 2} = \frac{10}{16}$$

Therefore, the required answer is 16

(C) Denominator of 20 is obtained by multiplying the given fraction by 4.

$$\frac{3}{5} = \frac{3 \times 4}{5 \times 4} = \frac{12}{20}$$

Therefore, the required answer is 12

(D) Numerator of 15 is obtained by dividing the given fraction by 3.

$$\frac{45}{60} = \frac{45 \div 3}{60 \div 3} = \frac{15}{20}$$

Therefore, the required answer is 20

(E) Denominator of 4 is obtained by dividing the given fraction by 6.

$$\frac{18}{24} = \frac{18 \div 6}{24 \div 6} = \frac{3}{4}$$

Therefore, the required answer is 3

4. Find the equivalent fraction of $\frac{3}{5}$ having

(A) denominator 20

(B) numerator 9

(C) denominator 30

(D) numerator 27

Solution:

(A) Given, $\frac{3}{5}$

Denominator of 20 is obtained by multiplying the given fraction by 4.

$$\frac{3}{5} = \frac{3 \times 4}{5 \times 4} = \frac{12}{20}$$

Hence, the equivalent fraction is $\frac{12}{20}$

(B) Given, $\frac{3}{5}$

Numerator of 9 is obtained by multiplying the given fraction by 3.

$$\frac{3}{5} = \frac{3 \times 3}{5 \times 3} = \frac{9}{15}$$

Hence, the equivalent fraction is $\frac{9}{15}$

(C) Given, $\frac{3}{5}$

Denominator of 30 is obtained by multiplying the given fraction by 6.

$$\frac{3}{5} = \frac{3 \times 6}{5 \times 6} = \frac{18}{30}$$

Hence, the equivalent fraction is $\frac{18}{30}$

(D) Given, $\frac{3}{5}$

Numerator of 27 is obtained by multiplying the given fraction by 9.

$$\frac{3}{5} = \frac{3 \times 9}{5 \times 9} = \frac{27}{45}$$

Hence, the equivalent fraction is $\frac{27}{45}$

5. Find the equivalent fraction of $\frac{36}{48}$ with:

(A) numerator 9

(B) denominator 4

Solution:

(A) Given, $\frac{36}{48}$

Numerator of 9 is obtained by dividing the given fraction by 4. Therefore,

$$\frac{36}{48} = \frac{36 \div 4}{48 \div 4} = \frac{9}{12}$$

Hence, the equivalent fraction is $\frac{9}{12}$

(B) Given, $\frac{36}{48}$

Denominator of 4 is obtained by dividing the given fraction by 12.
Therefore,

$$\frac{36}{48} = \frac{36 \div 12}{48 \div 12} = \frac{3}{4}$$

Hence, the equivalent fraction is $\frac{3}{4}$

6. Check whether the given fractions are equivalent:

(A) $\frac{5}{9}, \frac{30}{54}$

(B) $\frac{3}{10}, \frac{12}{50}$

(C) $\frac{7}{13}, \frac{5}{11}$

Solution:

Given, $\frac{5}{9}, \frac{30}{54}$

$$\frac{30}{54} = \frac{5 \times 6}{9 \times 6}$$

Since $\frac{30}{54}$ is obtained by multiplying numerator and denominator of $\frac{5}{9}$ by 6

Therefore, $\frac{5}{9}, \frac{30}{54}$ are equivalent.

(B) Given, $\frac{3}{10}, \frac{12}{50}$

If the given fractions are equivalent, the product obtained by cross multiplication must be equal.

By cross multiplying the following fractions: $\frac{3}{10}, \frac{12}{50}$

$$3 \times 50 = 12 \times 10$$

But clearly, $150 \neq 120$

Therefore, $\frac{3}{10}, \frac{12}{50}$ are not equivalent.

(C) Given, $\frac{7}{13}, \frac{5}{11}$

If the given fractions are equivalent, the product obtained by cross multiplication must be equal.

By cross multiplying the following fractions: $\frac{7}{13}, \frac{5}{11}$

$$7 \times 11 = 13 \times 5$$

But clearly, $77 \neq 65$

Therefore, $\frac{7}{13}, \frac{5}{11}$ are not equivalent.

7. Reduce the following fractions to simplest form:

(A) $\frac{48}{60}$

(B) $\frac{150}{60}$

(C) $\frac{84}{98}$

(D) $\frac{12}{52}$

(E) $\frac{7}{28}$

Solution:

(A) Given, $\frac{48}{60}$

The HCF of the given numerator and denominator is 12. Hence, we divide both the numerator and the denominator by 12 to obtain the simplest fraction.

$$\frac{48}{60} = \frac{48 \div 12}{60 \div 12} = \frac{4}{5}$$

Hence the simplest form of the given fraction is $\frac{4}{5}$.

(B) Given, $\frac{150}{60}$

The HCF of the given numerator and denominator is 30. Hence, we divide both the numerator and the denominator by 30 to obtain the simplest fraction.

$$\frac{150}{60} = \frac{150 \div 30}{60 \div 30} = \frac{5}{2}$$

Hence the simplest form of the given fraction is $\frac{5}{2}$.

(C) Given, $\frac{84}{98}$

The HCF of the given numerator and denominator is 14. Hence, we divide both the numerator and the denominator by 14 to obtain the simplest fraction.

$$\frac{84}{98} = \frac{84 \div 14}{98 \div 14} = \frac{6}{7}$$

Hence the simplest form of the given fraction is $\frac{6}{7}$

(D) Given, $\frac{12}{52}$

The HCF of the given numerator and denominator is 4. Hence, we divide both the numerator and the denominator by 4 to obtain the simplest fraction.

$$\frac{12}{52} = \frac{12 \div 4}{52 \div 4} = \frac{3}{13}$$

Hence the simplest form of the given fraction is $\frac{3}{13}$

(E) Given, $\frac{7}{28}$

The HCF of the given numerator and denominator is 7. Hence, we divide both the numerator and the denominator by 7 to obtain the simplest fraction.

$$\frac{7}{28} = \frac{7 \div 7}{28 \div 7} = \frac{1}{4}$$

Hence the simplest form of the given fraction is $\frac{1}{4}$

8. Ramesh had 20 pencils, Sheelu had 50 pencils and Jamaal had 80 pencils. After 4 months, Ramesh used up 10 pencils, Sheelu used up 25 pencils and Jamaal used up 40 pencils. What fraction did each use up? Check if each has used up an equal fraction of her/his pencils?

Solution:

Ramesh:

Total number of pencils = 20

Pencils used = 10

$$\text{Required fraction} = \frac{\text{Pencils used}}{\text{Total number of pencils he had}} = \frac{10}{20} = \frac{10 \div 10}{20 \div 10} = \frac{1}{2}$$

Sheelu:

Total number of pencils = 50

Pencils used = 25

$$\text{Required fraction} = \frac{\text{Pencils used}}{\text{Total number of pencils she had}} = \frac{25}{50} = \frac{25 \div 25}{50 \div 25} = \frac{1}{2}$$

Jamaal:

Total number of pencils = 80

Pencils used = 40

$$\text{Required fraction} = \frac{\text{Pencils used}}{\text{Total number of pencils he had}} = \frac{40}{80} = \frac{40 \div 40}{80 \div 40} = \frac{1}{2}$$

We can observe that, the fractions of the pencils each one of them are equivalent.

Hence, each of them has used the same up the same amount of pencil.

9. Match the equivalent fractions and write two more for each.

(i) $\frac{250}{400}$	(A) $\frac{2}{3}$
(ii) $\frac{180}{200}$	(B) $\frac{2}{5}$
(iii) $\frac{660}{990}$	(C) $\frac{1}{2}$
(iv) $\frac{180}{360}$	(D) $\frac{5}{8}$
(v) $\frac{220}{550}$	(E) $\frac{9}{10}$

Solution:

(i) Given, $\frac{250}{400}$

$$\frac{250}{400} = \frac{250 \div 50}{400 \div 50} = \frac{5}{8} [\because \text{HCF} = 50]$$

Two more equivalent fractions are:

$$\frac{5 \times 2}{8 \times 2} = \frac{10}{16}$$

$$\frac{5 \times 3}{8 \times 3} = \frac{15}{24}$$

Hence, the required equivalent fractions are $\frac{10}{16}$ and $\frac{15}{24}$

(ii) Given, $\frac{180}{200}$

$$\frac{180}{200} = \frac{180 \div 20}{200 \div 20} = \frac{9}{10} [\because \text{HCF} = 20]$$

Two more equivalent fractions are:

$$\frac{9 \times 2}{10 \times 2} = \frac{18}{20}$$

$$\frac{9 \times 3}{10 \times 3} = \frac{27}{30}$$

Hence, the required equivalent fractions are $\frac{18}{20}$ and $\frac{27}{30}$

(iii) Given, $\frac{660}{990}$

$$\frac{660}{990} = \frac{660 \div 330}{990 \div 330} = \frac{2}{3} [\because \text{HCF} = 330]$$

Two more equivalent fractions are:

$$\frac{2 \times 2}{3 \times 2} = \frac{4}{6}$$

$$\frac{2 \times 3}{3 \times 3} = \frac{6}{9}$$

Hence, the required equivalent fractions are $\frac{4}{6}$ and $\frac{6}{9}$

(iv) Given, $\frac{180}{360}$

$$\frac{180}{360} = \frac{180 \div 180}{360 \div 180} = \frac{1}{2} [\because \text{HCF} = 180]$$

Two more equivalent fractions are:

$$\frac{1 \times 2}{2 \times 2} = \frac{2}{4}$$

$$\frac{1 \times 3}{2 \times 3} = \frac{3}{6}$$

Hence, the required equivalent fractions are $\frac{2}{4}$ and $\frac{3}{6}$

(v) Given, $\frac{220}{550}$

$$\frac{220}{550} = \frac{220 \div 110}{550 \div 110} = \frac{2}{5} [\because \text{HCF} = 110]$$

Two more equivalent fractions are:

$$\frac{2 \times 2}{5 \times 2} = \frac{4}{10}$$

$$\frac{2 \times 3}{5 \times 3} = \frac{6}{15}$$

Hence, the required equivalent fractions are $\frac{4}{10}$ and $\frac{6}{15}$

$\frac{250}{400}$	(D) $\frac{5}{8}$
$\frac{180}{200}$	(E) $\frac{9}{10}$

$\frac{660}{990}$	(A) $\frac{2}{3}$
$\frac{180}{360}$	(C) $\frac{1}{2}$
$\frac{220}{550}$	(B) $\frac{2}{5}$

Exercise 7.4

1. Write shaded portion as fraction. Arrange them in ascending and descending order using correct sign ' $<$ ', ' $=$ ', ' $>$ ' between the fractions:

(a)



(b)



- (c) Show $\frac{2}{6}$, $\frac{4}{6}$, $\frac{8}{6}$ and $\frac{6}{6}$ on the number line. Put appropriate signs between the fractions given.

$$\frac{5}{6} \square \frac{2}{6}, \quad \frac{3}{6} \square 0, \quad \frac{1}{6} \square \frac{6}{6}, \quad \frac{8}{6} \square \frac{5}{6}$$

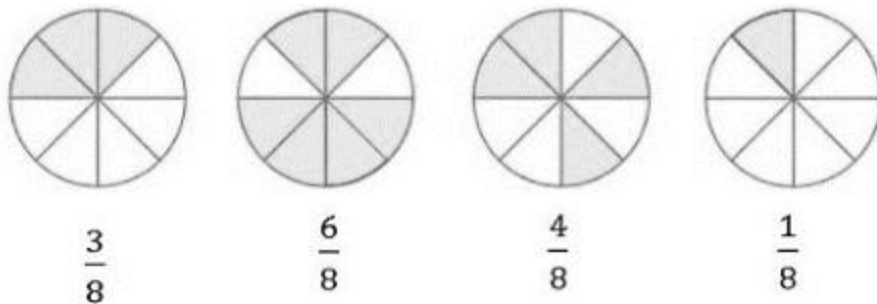
Solution:

We know that a fraction is a number representing part of a whole.

Here, the numerator represents the number of parts to be shaded. The denominator represents the number of equal parts into which the whole figure has been divided.

Therefore, the given fraction = $\frac{\text{Number of parts that are shaded}}{\text{Total number of equal parts}}$

(A)



From the figure given, we observe that the total number of parts are equal, i.e., 8.

The number of shaded parts are 3, 6, 4 and 1 respectively.

Therefore, we obtain,

$$\frac{3}{8}, \frac{6}{8}, \frac{4}{8}, \frac{1}{8}$$

We see that these are like fractions (fractions with same denominator)

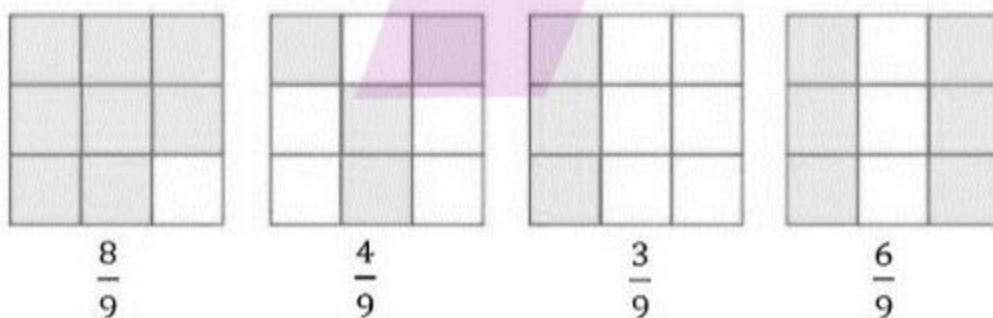
In like fractions, the fraction with greater numerator is larger.

So we obtain,

Ascending order: $\frac{1}{8} < \frac{3}{8} < \frac{4}{8} < \frac{6}{8}$

Descending order: $\frac{6}{8} > \frac{4}{8} > \frac{3}{8} > \frac{1}{8}$

(B)



From the figure given, we observe that the total number of parts are equal, i.e., 9.

The number of shaded parts is 8, 4, 3 and 6 respectively.

Therefore, we obtain,

$$\frac{8}{9}, \frac{4}{9}, \frac{3}{9}, \frac{6}{9}$$

We see that these are like fractions (fractions with same denominator)

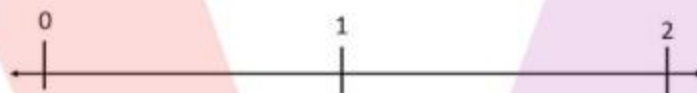
In like fractions, the fraction with greater numerator is larger.

So, we obtain,

$$\text{Ascending order: } \frac{3}{9} < \frac{4}{9} < \frac{6}{9} < \frac{8}{9}$$

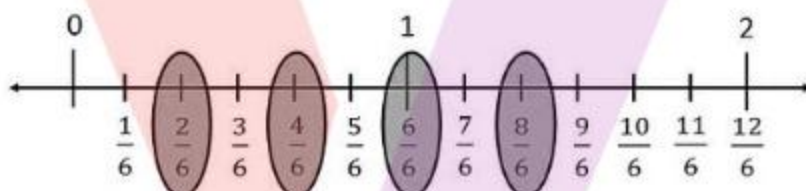
$$\text{Descending order: } \frac{8}{9} > \frac{6}{9} > \frac{4}{9} > \frac{3}{9}$$

(C) Number line



We see that all the given fractions have the same denominator, i.e., 6,

So, we divide the number line between 0 and 1 into 6 equal parts.



In like fractions, the fraction with greater numerator is larger.

So, we obtain,

$$\frac{5}{6} > \frac{2}{6}$$

$$\frac{1}{6} < \frac{6}{6}$$

$$\frac{3}{6} > \frac{0}{6}$$

$$\frac{8}{6} > \frac{5}{6}$$

2. Compare the fractions and put an appropriate sign.

(a) $\frac{3}{6} \square \frac{5}{6}$

(b) $\frac{1}{7} \square \frac{1}{4}$

(c) $\frac{4}{5} \square \frac{5}{5}$

(d) $\frac{3}{5} \square \frac{3}{7}$

Solution:

(a) Given, $\frac{3}{6} \square \frac{5}{6}$

Here, we see that the denominator is same,

So, the fraction with larger numerator is greater.

Therefore, $\frac{3}{6} < \frac{5}{6}$

(b) Given, $\frac{1}{7} \square \frac{1}{4}$

Here, we see that the denominators are different,

So, we have to cross multiply.

$$\frac{1}{7} \square \frac{1}{4}$$

$$1 \times 4 \square 1 \times 7$$

$$4 \square 7$$

As 4 is lesser than 7,

$$4 < 7$$

Therefore, as L.H.S. is smaller.

Hence, we get $\frac{1}{7} < \frac{1}{4}$

(c) Given, $\frac{4}{5} \square \frac{5}{5}$

Here, we see that the denominator is same,

So, the fraction with larger numerator is greater.

Therefore, $\frac{4}{5} < \frac{5}{5}$

(d) Given, $\frac{3}{5} \square \frac{3}{7}$

Here, we see that the denominators are different,

So, we have to cross multiply.

$$\frac{3}{5} \square \frac{3}{7}$$

$$3 \times 7 \square 3 \times 5$$

$$21 \square 15$$

As 21 is greater than 15,

$$21 > 15$$

Therefore, as L.H.S. is greater, $\frac{3}{5} > \frac{3}{7}$

3. Make five more such pairs and put appropriate signs.

(a) $\frac{9}{10} > \frac{6}{10}$

(b) $\frac{1}{3} > \frac{1}{6}$

(c) $\frac{1}{8} < \frac{1}{5}$

(d) $\frac{7}{8} < \frac{11}{8}$

(e) $\frac{11}{13} > \frac{9}{13}$

Solution:

(a) Given, $\frac{9}{10} \square \frac{6}{10}$

Here, we see that the denominator is same,

So, the fraction with larger numerator is greater.

Therefore, $\frac{9}{10} > \frac{6}{10}$

(b) Given, $\frac{1}{3} \square \frac{1}{6}$

Here, we see that the denominators are different,

So, we have to cross multiply.

$$\frac{1}{3} \square \frac{1}{6}$$

$$1 \times 6 \square 1 \times 3$$

$$6 \square 3$$

As 6 is greater than 3,

$$6 > 3$$

Therefore, $\frac{1}{3} > \frac{1}{6}$

(c) Given, $\frac{1}{8} \square \frac{1}{5}$

Here, we see that the denominators are different,

So, we have to cross multiply.

$$\frac{1}{8} \square \frac{1}{5}$$

$$1 \times 5 \square 1 \times 8$$

$$5 \square 8$$

As 5 is lesser than 8,

$$5 < 8$$

Therefore, L.H.S. is lesser.

$$\text{Hence, } \frac{1}{8} < \frac{1}{5}$$

(d) Given, $\frac{7}{8} \square \frac{11}{8}$

Here, we see that the denominator is same,

So, the fraction with larger numerator is greater.

$$\text{Therefore, } \frac{7}{8} < \frac{11}{8}$$

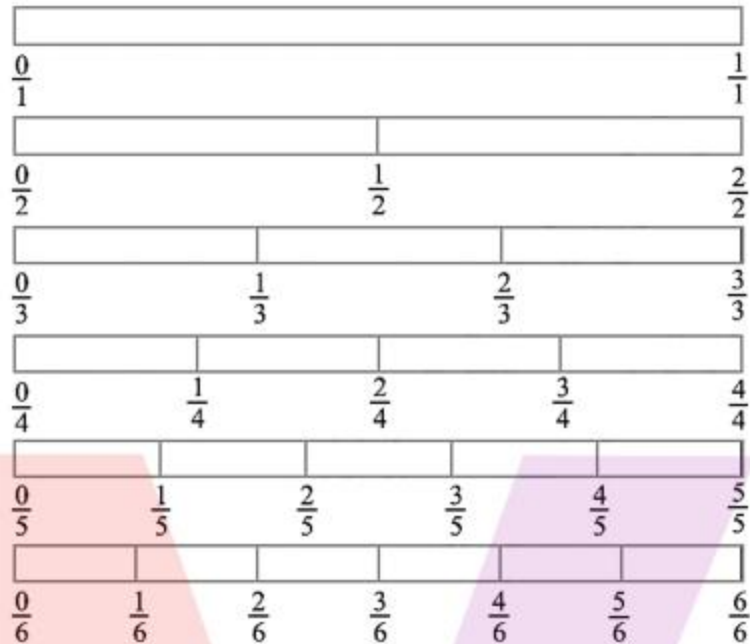
(e) Given, $\frac{11}{13} \square \frac{9}{13}$

Here, we see that the denominator is same,

So, the fraction with larger numerator is greater.

$$\text{Therefore, } \frac{11}{13} > \frac{9}{13}$$

4. Look at the figures and write ' $<$ ' or ' $>$ ', ' $=$ ' between the given pairs of fractions.

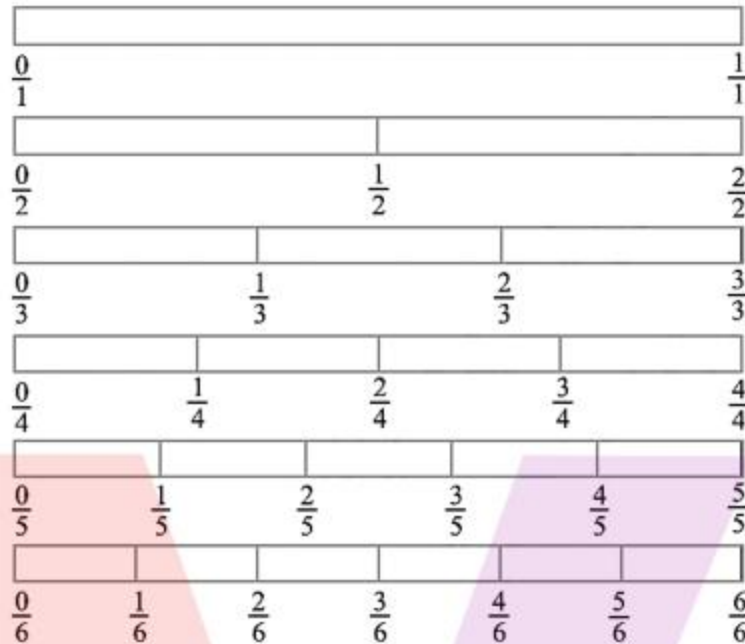


- (a) $\frac{1}{6} \square \frac{1}{3}$
 (b) $\frac{3}{4} \square \frac{2}{6}$
 (c) $\frac{2}{3} \square \frac{2}{4}$
 (d) $\frac{6}{6} \square \frac{3}{3}$
 (e) $\frac{5}{6} \square \frac{5}{5}$

Make five more such problems and solve them with your friends.

Solution:

(a) Given, $\frac{1}{6} \square \frac{1}{3}$

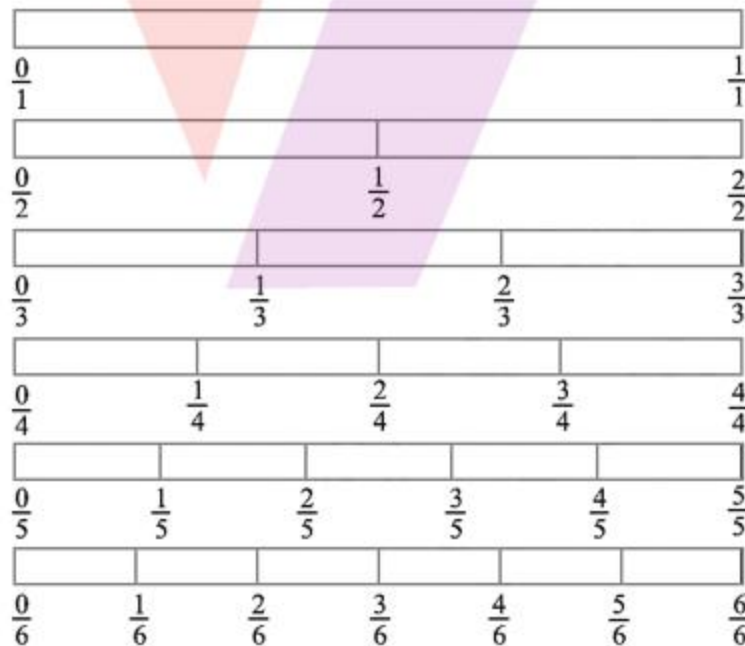


As $\frac{1}{6}$ is to the left of $\frac{1}{3}$,

$\frac{1}{6}$ is lesser than $\frac{1}{3}$,

Therefore, $\frac{1}{6} < \frac{1}{3}$

(b) Given, $\frac{3}{4} \square \frac{2}{6}$

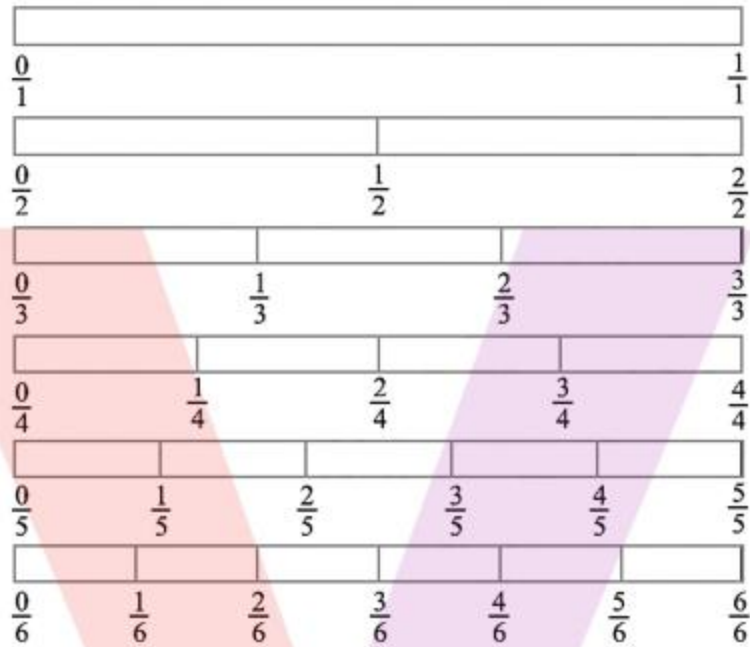


As $\frac{3}{4}$ is to the right of $\frac{2}{6}$,

$\frac{3}{4}$ is greater than $\frac{2}{6}$

Therefore, $\frac{3}{4} > \frac{2}{6}$

(c) Given, $\frac{2}{3} \square \frac{2}{4}$

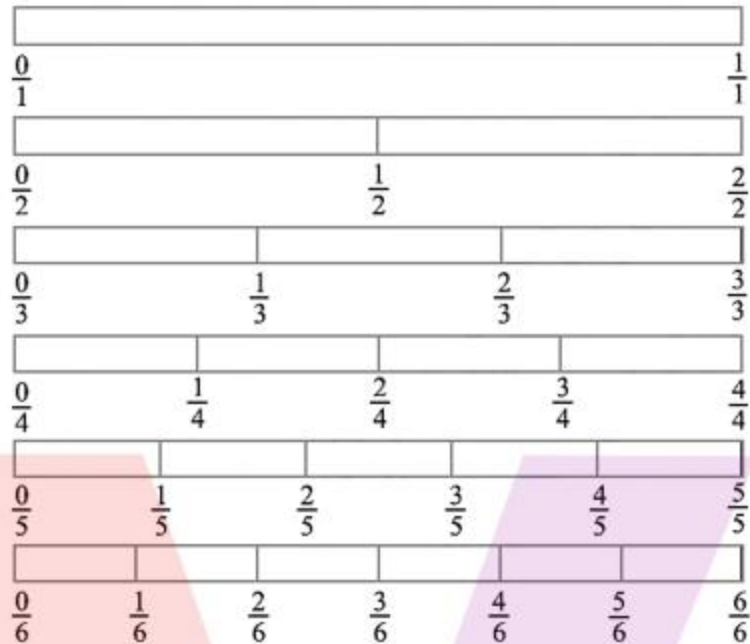


As $\frac{2}{3}$ is on the right of $\frac{2}{4}$,

$\frac{2}{3}$ is greater than $\frac{2}{4}$,

Therefore, $\frac{2}{3} > \frac{2}{4}$

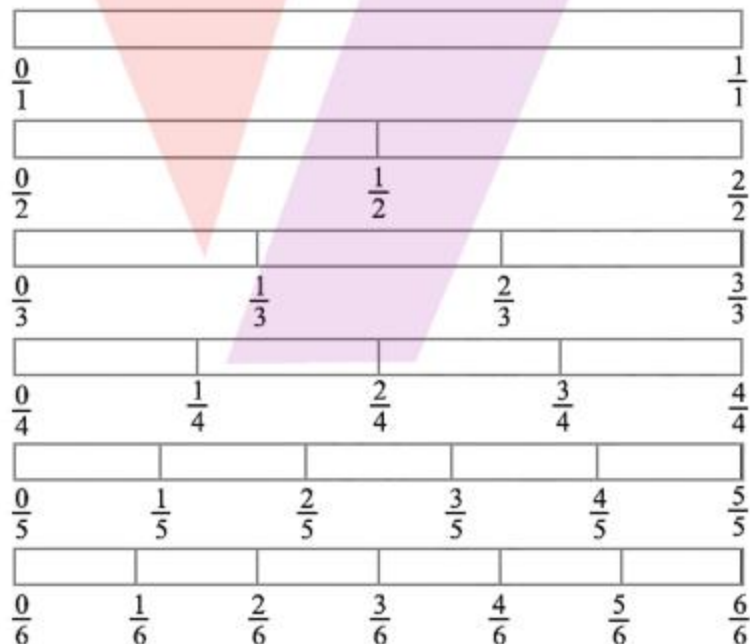
(d) Given, $\frac{6}{6} \square \frac{3}{3}$



As $\frac{6}{6}$ is on the same line as $\frac{3}{3}$, they are equal.

Therefore, $\frac{6}{6} = \frac{3}{3}$

(E) Given, $\frac{5}{6} \square \frac{5}{5}$



As $\frac{5}{6}$ is on the left of $\frac{5}{5}$, $\frac{5}{6}$ is lesser than $\frac{5}{5}$

Hence, $\frac{5}{6} < \frac{5}{5}$

5. Five more such problems:

(a) $\frac{1}{2} \square \frac{3}{6}$

(b) $\frac{2}{3} \square \frac{3}{5}$

(c) $\frac{3}{4} \square \frac{4}{6}$

(d) $\frac{5}{6} \square \frac{2}{2}$

(e) $\frac{0}{1} \square \frac{0}{6}$

Solution:

(a) Given, $\frac{1}{2} \square \frac{3}{6}$

As $\frac{1}{2}$ is on the same line as $\frac{3}{6}$, they are equal.

Therefore, $\frac{1}{2} = \frac{3}{6}$

(b) Given, $\frac{2}{3} \square \frac{3}{5}$

As $\frac{2}{3}$ is on the right of $\frac{3}{5}$, $\frac{2}{3}$ is greater than $\frac{3}{5}$

Therefore, $\frac{2}{3} > \frac{3}{5}$

(c) Given, $\frac{3}{4} \square \frac{4}{6}$

As $\frac{3}{4}$ is on the right of $\frac{4}{6}$, $\frac{3}{4}$ is greater than $\frac{4}{6}$

Therefore, $\frac{3}{4} > \frac{4}{6}$

(d) Given, $\frac{5}{6} \square \frac{2}{2}$

As $\frac{5}{6}$ is on the left of $\frac{2}{2}$, $\frac{5}{6}$ is lesser than $\frac{2}{2}$

Therefore, $\frac{5}{6} < \frac{2}{2}$

(e) Given, $\frac{0}{1} \square \frac{0}{6}$

As $\frac{0}{1}$ is on the same line as $\frac{0}{6}$, they are equal,

Therefore, $\frac{0}{1} = \frac{0}{6}$

5. How quickly can you do this? Fill appropriate sign. (' < ', ' = ', ' > ')

(a) $\frac{1}{2} \square \frac{1}{5}$

(b) $\frac{2}{4} \square \frac{3}{6}$

(c) $\frac{3}{5} \square \frac{2}{3}$

(d) $\frac{3}{4} \square \frac{2}{8}$

(e) $\frac{3}{5} \square \frac{6}{5}$

(f) $\frac{7}{9} \square \frac{3}{9}$

(g) $\frac{1}{4} \square \frac{2}{8}$

(h) $\frac{6}{10} \square \frac{4}{5}$

(i) $\frac{3}{4} \square \frac{7}{8}$

(j) $\frac{6}{10} \square \frac{3}{5}$

(k) $\frac{5}{7} \square \frac{15}{21}$

Solution:

(a) Given, $\frac{1}{2} \square \frac{1}{5}$

Here, we see that the denominators are different,

So, we have to cross multiply.

$$\frac{1}{2} \square \frac{1}{5}$$

$$1 \times 5 \square 1 \times 2$$

$$5 \square 2$$

As 5 is greater than 2,

$$5 > 2$$

Therefore, as L.H.S. is greater.

$$\text{Hence, } \frac{1}{2} > \frac{1}{5}$$

(b) Given, $\frac{2}{4} \square \frac{3}{6}$

Here, we see that the denominators are different,

So, we have to cross multiply.

$$\frac{2}{4} \square \frac{3}{6}$$

$$2 \times 6 \square 3 \times 4$$

$$12 \square 12$$

$$12 = 12$$

Therefore, as L.H.S. is equal to R.H.S.

$$\text{Hence, } \frac{2}{4} = \frac{3}{6}$$

(c) Given, $\frac{3}{5} \square \frac{2}{3}$

Here, we see that the denominators are different,

So, we have to cross multiply.

$$\frac{3}{5} \square \frac{2}{3}$$

$$3 \times 3 \square 2 \times 5$$

$$9 \square 10$$

As 9 is lesser than 10,

$$9 < 10$$

Therefore, as L.H.S. is lesser.

$$\text{Hence, } \frac{3}{5} < \frac{2}{3}$$

(d) Given, $\frac{3}{4} \square \frac{2}{8}$

Here, we see that the denominators are different,

So, we have to cross multiply.

$$\frac{3}{4} \square \frac{2}{8}$$

$$1 \times 5 \square 1 \times 2$$

$$5 \square 2$$

As 5 is greater than 2,

$$5 > 2$$

Therefore, as L.H.S. is greater, we get,

$$\frac{3}{4} > \frac{2}{8}$$

(e) Given, $\frac{3}{5} \square \frac{6}{5}$

Here, we see that the denominator is same,

So, the fraction with larger numerator is greater.

$$\text{Therefore, } \frac{3}{5} < \frac{6}{5}$$

(f) Given, $\frac{7}{9} \square \frac{3}{9}$

Here, we see that the denominator is same,

So, the fraction with larger numerator is greater.

$$\text{Therefore, } \frac{7}{9} > \frac{3}{9}$$

(g) Given, $\frac{1}{4} \square \frac{2}{8}$

Here, we see that the denominators are different,

So, we have to cross multiply.

$$\frac{1}{4} \square \frac{2}{8}$$

$$1 \times 8 \square 2 \times 4$$

$$8 \square 8$$

$$8 = 8$$

Therefore, as L.H.S. is equal to R.H.S.

$$\text{Hence, } \frac{1}{4} = \frac{2}{8}$$

(h) Given, $\frac{6}{10} \square \frac{4}{5}$

Here, we see that the denominators are different,

So, we have to cross multiply.

$$\frac{6}{10} \square \frac{4}{5}$$

$$6 \times 5 \square 4 \times 10$$

$$30 \square 40$$

As 30 is lesser than 40,

$$30 < 40$$

Therefore, as L.H.S. is lesser.

$$\text{Hence, } \frac{6}{10} < \frac{4}{5}$$

(i) Given, $\frac{3}{4} \square \frac{7}{8}$

Here, we see that the denominators are different,

So, we have to cross multiply.

$$\frac{3}{4} \square \frac{7}{8}$$

$$3 \times 8 \square 7 \times 4$$

$$24 \square 28$$

As 24 is lesser than 28,

$$24 < 28$$

Therefore, as L.H.S. is lesser.

$$\text{Hence, } \frac{3}{4} < \frac{7}{8}$$

(j) Given, $\frac{6}{10} \square \frac{3}{5}$

Here, we see that the denominators are different,

So, we have to cross multiply.

$$\frac{6}{10} \square \frac{3}{5}$$

$$6 \times 5 \square 3 \times 10$$

$$30 \square 30$$

$$30 = 30$$

Therefore, as L.H.S. is equal to R.H.S.

$$\text{Hence, } \frac{6}{10} = \frac{3}{5}$$

(k) Given, $\frac{5}{7} \square \frac{15}{21}$

Here, we see that the denominators are different,

So, we have to cross multiply.

$$\frac{5}{7} \square \frac{15}{21}$$

$$5 \times 21 \square 15 \times 7$$

$$105 \square 105$$

$$105 = 105$$

Therefore, as L.H.S. is equal to R.H.S.

$$\text{Hence, } \frac{5}{7} = \frac{15}{21}$$

6. The following fractions represent just three different numbers. Separate them into three groups of equivalent fractions, by changing each one to its simplest form.

(a) $\frac{2}{12}$

(b) $\frac{3}{15}$

(c) $\frac{8}{50}$

(d) $\frac{16}{100}$

(e) $\frac{10}{60}$

(f) $\frac{15}{75}$

(g) $\frac{12}{60}$

(h) $\frac{16}{96}$

(i) $\frac{12}{75}$

(j) $\frac{12}{72}$

(k) $\frac{3}{18}$

(l) $\frac{4}{25}$

Solution:

(a) Given, $\frac{2}{12}$

Dividing numerator and denominator by 2, we get,

$$\frac{2 \div 2}{12 \div 2} = \frac{1}{6}$$

Therefore, the simplest form is $\frac{1}{6}$

(b) Given, $\frac{3}{15}$

Dividing numerator and denominator by 3, we get,

$$\frac{3 \div 3}{15 \div 3} = \frac{1}{5}$$

Therefore, the simplest form is $\frac{1}{5}$

(c) Given, $\frac{8}{50}$

Dividing numerator and denominator by 2, we get,

$$\frac{8 \div 2}{50 \div 2} = \frac{4}{25}$$

Therefore, the simplest form is $\frac{4}{25}$

(d) Given, $\frac{16}{100}$

Dividing numerator and denominator by 2, we get,

$$\frac{16 \div 2}{100 \div 2} = \frac{8}{50}$$

Further dividing numerator and denominator by 2, we get,

$$\frac{8 \div 2}{50 \div 2} = \frac{4}{25}$$

Therefore, the simplest form is $\frac{4}{25}$

(e) Given, $\frac{10}{60}$

Cancelling the zero from the numerator and denominator, we get,

$$\frac{10}{60} = \frac{1}{6}$$

Therefore, the simplest form is $\frac{1}{6}$

(f) Given, $\frac{15}{75}$

Dividing numerator and denominator by 3, we get,

$$\frac{15 \div 3}{75 \div 3} = \frac{5}{25}$$

Further dividing numerator and denominator by 5, we get,

$$\frac{5 \div 5}{25 \div 5} = \frac{1}{5}$$

Therefore, the simplest form is $\frac{1}{5}$

(g) Given, $\frac{12}{60}$

Dividing numerator and denominator by 2, we get,

$$\frac{12 \div 2}{60 \div 2} = \frac{6}{30}$$

Further dividing numerator and denominator by 2, we get,

$$\frac{6 \div 2}{30 \div 2} = \frac{3}{15}$$

Again, dividing numerator and denominator by 3, we get,

$$\frac{3 \div 3}{15 \div 3} = \frac{1}{5}$$

Therefore, the simplest form is $\frac{1}{5}$

(h) Given, $\frac{16}{96}$

We can simplify the given fraction as follows,

$$\frac{16 \div 2}{96 \div 2} = \frac{8}{48}$$

$$\frac{8 \div 2}{48 \div 2} = \frac{4}{24}$$

$$\frac{4 \div 2}{24 \div 2} = \frac{2}{12}$$

$$\frac{2 \div 2}{12 \div 2} = \frac{1}{6}$$

Therefore, the simplest form is $\frac{1}{6}$

(i) Given, $\frac{12}{75}$

Dividing numerator and denominator by 3, we get,

$$\frac{12 \div 3}{75 \div 3} = \frac{4}{25}$$

Therefore, the simplest form is $\frac{4}{25}$

(j) Given, $\frac{12}{72}$

We can simplify the given fraction as follows,

$$\frac{12 \div 2}{72 \div 2} = \frac{6}{36}$$

$$\frac{6 \div 2}{36 \div 2} = \frac{3}{18}$$

$$\frac{3 \div 3}{18 \div 3} = \frac{1}{6}$$

Therefore, the simplest form is $\frac{1}{6}$

(k) Given, $\frac{3}{18}$

Dividing numerator and denominator by 3, we get,

$$\frac{3 \div 3}{18 \div 3} = \frac{1}{6}$$

Therefore, the simplest form is $\frac{1}{6}$

(l) Given, $\frac{4}{25}$

As there are no common divisors for the numerator and denominator, it cannot be simplified further,

Therefore, the simplest form is $\frac{4}{25}$

Equivalent groups:

I group: $\frac{1}{5}$ [(b), (f), (g)]

II group: $\frac{1}{6}$ [(a), (e), (h), (j), (k)]

III group: $\frac{4}{25}$ [(c), (d), (i), (l)]

7. Find answers to the following. Write and indicate how you solved them.

(a) Is $\frac{5}{9}$ equal to $\frac{4}{5}$?

(b) Is $\frac{9}{16}$ equal to $\frac{5}{9}$?

(c) Is $\frac{4}{5}$ equal to $\frac{16}{20}$?

(d) Is $\frac{1}{15}$ equal to $\frac{4}{30}$?

Solution:

(a) Given, $\frac{5}{9}$ and $\frac{4}{5}$

3	9, 5
3	3, 5
5	1, 5
	1, 1

Common denominator = L. C. M of 5 and 9

Common denominator = $3 \times 3 \times 5$

Common denominator = 45

$$\Rightarrow \frac{5 \times 5}{9 \times 5} = \frac{25}{45} \text{ and } \frac{4 \times 9}{5 \times 9} = \frac{36}{45} [\because \text{L.C.M. of 9 and 5 is 45}]$$

Since, $\frac{25}{45} \neq \frac{36}{45}$

Therefore, $\frac{5}{9} \neq \frac{4}{5}$

Hence, they are not equal.

(b) Given, $\frac{9}{16}$ and $\frac{5}{9}$

2	16, 9
2	8, 9
2	4, 9
2	2, 9
3	1, 9
3	1, 3
	1, 1

Common denominator = L. C. M of 16 and 9

Common denominator = $2 \times 2 \times 2 \times 2 \times 3 \times 3$

Common denominator = 144

$$\Rightarrow \frac{9 \times 9}{16 \times 9} = \frac{81}{144} \text{ and } \frac{5 \times 16}{9 \times 16} = \frac{80}{144} [\because \text{L.C.M. of 16 and 9 is 144}]$$

Since, $\frac{81}{144} \neq \frac{80}{144}$

Therefore, $\frac{9}{16} \neq \frac{5}{9}$

Hence, they are not equal.

(c) Given, $\frac{4}{5}$ and $\frac{16}{20}$

2	5, 20
2	5, 10
5	5, 5
	1, 1

Common denominator = L. C. M of 5 and 20

Common denominator = $2 \times 2 \times 5$

Common denominator = 20

$\Rightarrow \frac{4 \times 20}{5 \times 20} = \frac{80}{100}$ and $\frac{16 \times 5}{20 \times 5} = \frac{80}{100}$ [\because L.C.M. of 5 and 20 is 100]

Since, $\frac{80}{100} = \frac{80}{100}$

Therefore, $\frac{4}{5} = \frac{16}{20}$

Hence, they are equal.

(d) Given, $\frac{1}{15}$ and $\frac{4}{30}$

2	15, 30
3	15, 15
5	5, 5
	1, 1

Common denominator = L. C. M of 15 and 30

Common denominator = $2 \times 3 \times 5$

Common denominator = 30

$$\Rightarrow \frac{1 \times 2}{15 \times 2} = \frac{2}{30} \text{ and } \frac{4 \times 1}{30 \times 1} = \frac{4}{30} [\because \text{L.C.M. of 15 and 30 is 30}]$$

$$\text{Since, } \frac{2}{30} \neq \frac{4}{30}$$

$$\text{Therefore, } \frac{1}{15} \neq \frac{4}{30}$$

Hence, they are not equal.

8. Ila read 25 pages of a book containing 100 pages. Lalita read $\frac{2}{5}$ of the same book. Who read less?

Solution:

Given,

Ila reads 25 pages out of 100 pages,

$$\text{Fraction of reading the pages} = \frac{25}{100}$$

$$\text{Fraction read} = \frac{25 \div 5}{100 \div 5}$$

$$\text{Fraction read} = \frac{5 \div 5}{20 \div 5}$$

Fraction read $\frac{1}{4}$ th part of the book

Lalita read $\frac{2}{5}$ th part of book

We have to find out who read less,

So,

Since the denominators are different, we need to make the denominators same by finding their common denominator.

2	4, 5
2	2, 5
5	1, 5
	1, 1

Common denominator = L. C. M of 4 and 5

Common denominator = $2 \times 2 \times 5$

Common denominator = 20

Now,

$$\frac{1}{4} = \frac{1 \times 5}{4 \times 5} = \frac{5}{20}$$

$$\frac{2}{5} = \frac{2 \times 4}{5 \times 4} = \frac{8}{20}$$

Since $\frac{5}{20} < \frac{8}{20}$

Therefore, $\frac{1}{4} < \frac{2}{5}$

Hence, Ila read less.

9. Rafiq exercised for $\frac{3}{6}$ of an hour, while Rohit exercised for $\frac{3}{4}$ of an hour. Who exercised for a longer time?

Solution:

Given,

Rafiq exercised $\frac{3}{6}$ of an hour.

Rohit exercised $\frac{3}{4}$ of an hour.

Now, we have to compare these fractions to see who exercised for a longer time.

So, since the denominators are different, we need to make the denominators same by finding their common denominator.

2	6, 4
2	3, 2
3	3, 1
	1, 1

Common denominator = L. C. M of 4 and 6

Common denominator = $2 \times 2 \times 3$

Common denominator = 12

Now,

$$\frac{3}{6} = \frac{3 \times 2}{6 \times 2} = \frac{6}{12}$$

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

Since $\frac{6}{12} < \frac{9}{12}$

$\Rightarrow \frac{3}{6} < \frac{3}{4}$

Therefore, Rohit exercised for a longer time.

10. In a class A of 25 students, 20 passed with 60% or more marks; in another class B of 30 students, 24 passed with 60% or more marks. In which class was a greater fraction of students getting with 60% or more marks?

Solution:

Given,

In class A, 20 passed out of 25, i.e., $\frac{20}{25}$

Fraction passed = $\frac{20 \div 5}{25 \div 5}$

Fraction passed = $\frac{4}{5}$

In class B, 24 passed out of 30, i.e., $\frac{24}{30}$

Fraction passed = $\frac{24 \div 2}{30 \div 2}$

Fraction passed = $\frac{12 \div 3}{15 \div 3}$

Fraction passed = $\frac{4}{5}$

Hence, each class have same fraction of student getting with 60% or more marks.

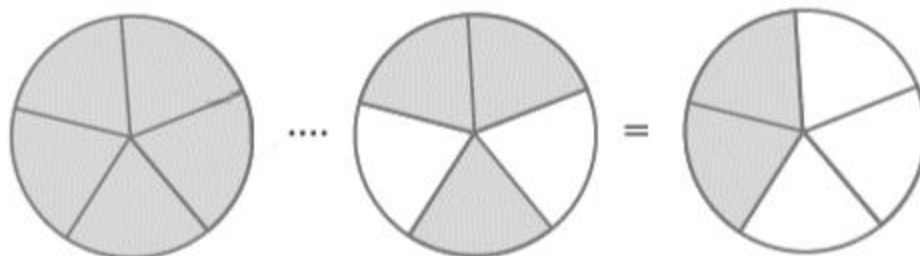
Exercise 7.5

1. Write these fractions appropriately as additions or subtractions:

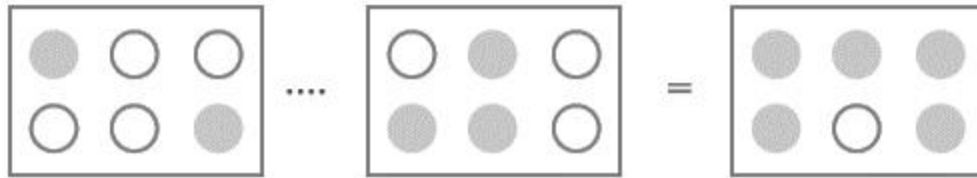
(a)



(b)



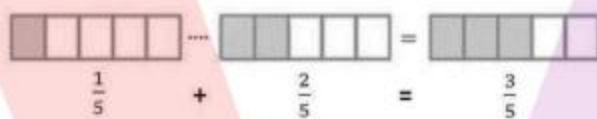
(c)



Solution:

(a) From the given figure,

By adding we get,

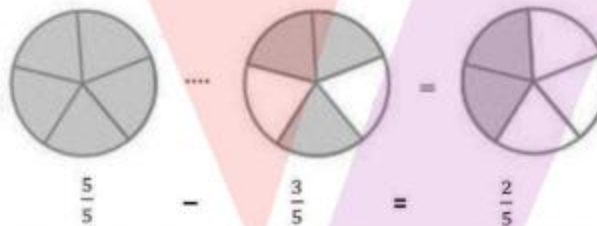


$$\frac{1}{5} + \frac{2}{5} = \frac{1+2}{5} = \frac{3}{5}$$

Hence, the required fraction is $\frac{3}{5}$

(b) From the given figure,

By subtracting we get,

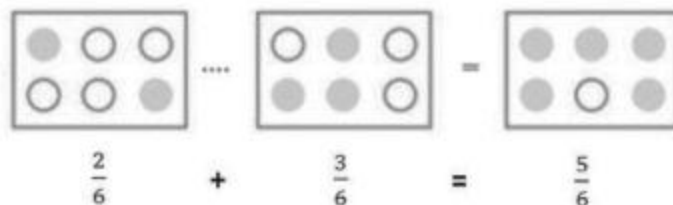


$$\frac{5}{5} - \frac{3}{5} = \frac{5-3}{5} = \frac{2}{5}$$

Hence, the required fraction is $\frac{2}{5}$

(c) From the given figure,

By adding we get,



$$\frac{2}{6} + \frac{3}{6} = \frac{2+3}{6} = \frac{5}{6}$$

Hence, the required fraction is $\frac{5}{6}$

2. Solve:

(a) $\frac{1}{18} + \frac{1}{18}$

(b) $\frac{8}{15} + \frac{3}{15}$

(c) $\frac{7}{7} - \frac{5}{7}$

(d) $\frac{1}{22} + \frac{21}{22}$

(e) $\frac{12}{15} - \frac{7}{15}$

(f) $\frac{5}{8} + \frac{3}{8}$

(g) $1 - \frac{2}{3} \left(1 = \frac{3}{3}\right)$

(h) $\frac{1}{4} + \frac{0}{4}$

(i) $3 - \frac{12}{5}$

Solution:

(a) Given, $\frac{1}{18} + \frac{1}{18}$
 $\Rightarrow \frac{1}{18} + \frac{1}{18} = \frac{1+1}{18}$
 $\Rightarrow \frac{1}{18} + \frac{1}{18} = \frac{2}{18}$
 $\Rightarrow \frac{1}{18} + \frac{1}{18} = \frac{1}{9}$

Therefore, the required fraction is $\frac{1}{9}$

(b) Given, $\frac{8}{15} + \frac{3}{15}$
 $\Rightarrow \frac{8}{15} + \frac{3}{15} = \frac{8+3}{15}$
 $\Rightarrow \frac{8}{15} + \frac{3}{15} = \frac{11}{15}$

Therefore, the required fraction is $\frac{11}{15}$

(c) Given, $\frac{7}{7} - \frac{5}{7}$
 $\Rightarrow \frac{7}{7} - \frac{5}{7} = \frac{7-5}{7}$
 $\Rightarrow \frac{7}{7} - \frac{5}{7} = \frac{2}{7}$

Therefore, the required fraction is $\frac{2}{7}$

(d) Given, $\frac{1}{22} + \frac{21}{22}$
 $\Rightarrow \frac{1}{22} + \frac{21}{22} = \frac{1+21}{22}$
 $\Rightarrow \frac{1}{22} + \frac{21}{22} = \frac{22}{22} = 1$

Therefore, the required answer is 1

(e) Given, $\frac{12}{15} - \frac{7}{15}$
 $\frac{12}{15} - \frac{7}{15} = \frac{12-7}{15}$
 $\Rightarrow \frac{12}{15} - \frac{7}{15} = \frac{5}{15}$
 $\Rightarrow \frac{12}{15} - \frac{7}{15} = \frac{1}{3}$

Therefore, the required fraction is $\frac{1}{3}$

(f) Given, $\frac{5}{8} + \frac{3}{8}$
 $\Rightarrow \frac{5}{8} + \frac{3}{8} = \frac{8}{8} = 1$

Therefore, the required answer is 1

(g) Given, $1 - \frac{2}{3}$
 $\Rightarrow 1 - \frac{2}{3} = \frac{3}{3} - \frac{2}{3}$
 $\Rightarrow 1 - \frac{2}{3} = \frac{3-2}{3}$
 $\Rightarrow 1 - \frac{2}{3} = \frac{1}{3}$

Therefore, the required fraction is $\frac{1}{3}$

(h) Given, $\frac{1}{4} + \frac{0}{4}$

$$\Rightarrow \frac{1}{4} + \frac{0}{4} = \frac{1+0}{4}$$

$$\Rightarrow \frac{1}{4} + \frac{0}{4} = \frac{1}{4}$$

Therefore, the required fraction is $\frac{1}{4}$

(i) Given, $3 - \frac{12}{5}$

$$\Rightarrow 3 - \frac{12}{5} = \frac{15}{5} - \frac{12}{5}$$

$$\Rightarrow 3 - \frac{12}{5} = \frac{15 - 12}{5}$$

$$\Rightarrow 3 - \frac{12}{5} = \frac{3}{5}$$

Therefore, the required fraction is $\frac{3}{5}$

3. Shubham painted $\frac{2}{3}$ of the wall space in his room. His sister Madhavi helped and painted $\frac{1}{3}$ of the wall space. How much did they paint together?

Solution:

Given,

$$\text{Fraction of wall painted by Shubham} = \frac{2}{3}$$

$$\text{Fraction of wall painted by Madhavi} = \frac{1}{3}$$

$$\text{Total painting by both of them} = \frac{2}{3} + \frac{1}{3}$$

$$\Rightarrow \text{Total painting by both of them} = \frac{2+1}{3}$$

$$\Rightarrow \text{Total painting by both of them} = \frac{3}{3} = 1$$

Hence, they painted the complete wall together.

4. Fill in the missing fractions.

(A) $\frac{7}{10} - \square = \frac{3}{10}$

(B) $\square - \frac{3}{21} = \frac{5}{21}$

(C) $\square - \frac{3}{6} = \frac{3}{6}$

(D) $\square + \frac{5}{27} = \frac{12}{27}$

Solution:

(a) Given, $\frac{7}{10} - \square = \frac{3}{10}$

$$\frac{7}{10} - \frac{3}{10} = \square$$

$$\Rightarrow \frac{7-3}{10} = \square$$

$$\Rightarrow \frac{4}{10} = \square$$

$$\Rightarrow \frac{4 \div 2}{10 \div 2} = \square$$

$$\Rightarrow \frac{2}{5} = \square$$

Thus, the missing fraction is $\frac{4}{10} (= \frac{2}{5})$

(b) Given, $\square - \frac{3}{21} = \frac{5}{21}$

$$\square = \frac{5}{21} + \frac{3}{21}$$

$$\Rightarrow \square = \frac{5+3}{21}$$

$$\Rightarrow \square = \frac{8}{21}$$

Therefore, the missing fraction is $\frac{8}{21}$

(c) Given, $\square - \frac{3}{6} = \frac{3}{6}$

$$\square = \frac{3}{6} + \frac{3}{6}$$

$$\Rightarrow \square = \frac{3+3}{6}$$

$$\Rightarrow \square = \frac{6}{6}$$

$$\Rightarrow \square = \frac{6 \div 6}{6 \div 6} = 1$$

Hence, the missing fraction is $\frac{6}{6} = 1$

(d) Given, $\square + \frac{5}{27} = \frac{12}{27}$

$$\square = \frac{12}{27} - \frac{5}{27}$$

$$\Rightarrow \square = \frac{12 - 5}{27}$$

$$\Rightarrow \square = \frac{7}{27}$$

Thus, the missing fraction is $\frac{7}{27}$

5. Javed was given $\frac{5}{7}$ of a basket of oranges. What fraction of oranges was left in the basket?

Solution:

We know that, Total = 1

Given,

$$\text{Fraction of Orange with Javed} = \frac{5}{7}$$

$$\therefore \text{Fraction of Orange left} = 1 - \frac{5}{7}$$

$$\text{Fraction of Orange left} = \frac{7}{7} - \frac{5}{7}$$

$$\text{Fraction of Orange left} = \frac{7-5}{7}$$

$$\text{Fraction of Orange left} = \frac{2}{7}$$

Thus, $\frac{2}{7}$ basket of oranges is left.

Exercise 7.6

1. Solve

(A) $\frac{2}{3} + \frac{1}{7}$

(B) $\frac{3}{10} + \frac{7}{15}$

(C) $\frac{4}{9} + \frac{2}{7}$

(D) $\frac{5}{7} + \frac{1}{3}$

(E) $\frac{2}{5} + \frac{1}{6}$

(F) $\frac{4}{5} + \frac{2}{3}$

(G) $\frac{3}{4} - \frac{1}{3}$

(H) $\frac{5}{6} - \frac{1}{3}$

(I) $\frac{2}{3} + \frac{3}{4} + \frac{1}{2}$

(J) $\frac{1}{2} + \frac{1}{3} + \frac{1}{6}$

(K) $1\frac{1}{3} + 3\frac{2}{3}$

(L) $4\frac{2}{3} + 3\frac{1}{4}$

(M) $\frac{16}{5} - \frac{7}{5}$

(N) $\frac{4}{3} - \frac{1}{2}$

Solution:

(a) Given, $\frac{2}{3} + \frac{1}{7}$

To add two unlike fraction, we first find the L.C.M. of their denominators.

L.C.M. of 3 and 7 is 21

$$\begin{aligned}\therefore \frac{2}{3} + \frac{1}{7} &= \frac{2 \times 7 + 1 \times 3}{21} \\ &= \frac{14 + 3}{21} = \frac{17}{21}\end{aligned}$$

Hence, the required fraction is $\frac{17}{21}$

(b) Given, $\frac{3}{10} + \frac{7}{15}$

To add two unlike fraction, we first find the L.C.M. of their denominators.

L.C.M. of 10 and 15 is 30

$$\begin{aligned}\therefore \frac{3}{10} + \frac{7}{15} &= \frac{3 \times 3}{10 \times 3} + \frac{7 \times 2}{15 \times 2} \\ &= \frac{3 \times 3 + 7 \times 2}{30} \\ &= \frac{9 + 14}{30} = \frac{23}{30}\end{aligned}$$

Hence, the required fraction is $\frac{23}{30}$

(c) Given, $\frac{4}{9} + \frac{2}{7}$

To add two unlike fraction, we first find the L.C.M. of their denominators.

L.C.M. of 9 and 7 is 63

$$\begin{aligned}\therefore \frac{4}{9} + \frac{2}{7} &= \frac{4 \times 7}{9 \times 7} + \frac{2 \times 9}{7 \times 9} \\ &= \frac{4 \times 7 + 2 \times 9}{63} \\ &= \frac{28 + 18}{63} = \frac{46}{63}\end{aligned}$$

Hence, the required fraction is $\frac{46}{63}$

(d) Given, $\frac{5}{7} + \frac{1}{3}$

To add two unlike fraction, we first find the L.C.M. of their denominators.

L.C.M. of 7 and 3 is 21

$$\begin{aligned}\therefore \frac{5}{7} + \frac{1}{3} &= \frac{5 \times 3}{7 \times 3} + \frac{1 \times 7}{3 \times 7} \\ &= \frac{5 \times 3 + 7 \times 1}{21} \\ &= \frac{15 + 7}{21} = \frac{22}{21} = 1 \frac{1}{21}\end{aligned}$$

Hence, the required fraction is $1 \frac{1}{21}$

(e) Given, $\frac{2}{5} + \frac{1}{6}$

To add two unlike fraction, we first find the L.C.M. of their denominators.

L.C.M. of 5 and 6 is 30

$$\begin{aligned}\therefore \frac{2}{5} + \frac{1}{6} &= \frac{2 \times 6}{5 \times 6} + \frac{1 \times 5}{6 \times 5} \\ &= \frac{2 \times 6 + 5 \times 1}{30} \\ &= \frac{12 + 5}{30} = \frac{17}{30}\end{aligned}$$

Hence, the required fraction is $\frac{17}{30}$

(f) Given, $\frac{4}{5} + \frac{2}{3}$

To add two unlike fraction, we first find the L.C.M. of their denominators.

L.C.M. of 5 and 3 is 15

$$\begin{aligned}\therefore \frac{4}{5} + \frac{2}{3} &= \frac{4 \times 3}{5 \times 3} + \frac{2 \times 5}{3 \times 5} \\ &= \frac{4 \times 3 + 2 \times 5}{15} \\ &= \frac{12 + 10}{15} = \frac{22}{15} = 1\frac{7}{15}\end{aligned}$$

Hence, the required fraction is $1\frac{7}{15}$

(g) Given, $\frac{3}{4} - \frac{1}{3}$

To subtract two unlike fraction, we first find the L.C.M. of their denominators.

$$\begin{aligned}\text{L.C.M. of 4 and 3 is 12} \\ \therefore \frac{3}{4} - \frac{1}{3} &= \frac{3 \times 3}{4 \times 3} - \frac{1 \times 4}{3 \times 4} \\ &= \frac{3 \times 3 - 4 \times 1}{12} \\ &= \frac{9 - 4}{12} = \frac{5}{12}\end{aligned}$$

Hence, the required fraction is $\frac{5}{12}$

(h) Given, $\frac{5}{6} - \frac{1}{3}$

To subtract two unlike fraction, we first find the L.C.M. of their denominators.

$$\begin{aligned}\text{L.C.M. of 6 and 3 is 6} \\ \therefore \frac{5}{6} - \frac{1}{3} &= \frac{5 \times 1}{6 \times 1} - \frac{1 \times 2}{3 \times 2} \\ &= \frac{5 \times 1 - 2 \times 1}{6} \\ &= \frac{5 - 2}{6} = \frac{3}{6} = \frac{1}{2}\end{aligned}$$

Hence, the required fraction is $\frac{1}{2}$

(i) Given, $\frac{2}{3} + \frac{3}{4} + \frac{1}{2}$

To add three unlike fraction, we first find the L.C.M. of their denominators.

L.C.M. of 3, 4 and 2 is 12

$$\begin{aligned}\therefore \frac{2}{3} + \frac{3}{4} + \frac{1}{2} &= \frac{2 \times 4}{3 \times 4} + \frac{3 \times 3}{4 \times 3} + \frac{1 \times 6}{2 \times 6} \\ &= \frac{2 \times 4 + 3 \times 3 + 1 \times 6}{12} \\ &= \frac{6 + 9 + 6}{12} = \frac{23}{12} = 1 \frac{11}{12}\end{aligned}$$

Hence, the required fraction is $1 \frac{11}{12}$

(j) Given, $\frac{1}{2} + \frac{1}{3} + \frac{1}{6}$

To add three unlike fraction, we first find the L.C.M. of their denominators.

L.C.M. of 2, 3 and 6 is 6

$$\begin{aligned}\therefore \frac{1}{2} + \frac{1}{3} + \frac{1}{6} &= \frac{1 \times 3}{2 \times 3} + \frac{1 \times 2}{3 \times 2} + \frac{1 \times 1}{6 \times 1} \\ &= \frac{1 \times 3 + 1 \times 2 + 1 \times 1}{6} \\ &= \frac{3 + 2 + 1}{6} = \frac{6}{6} = 1\end{aligned}$$

Hence, the required answer is 1

(k) Given, $1 \frac{1}{3} + 3 \frac{2}{3}$

Converting the given mixed fractions to improper fractions:

$$\frac{(\text{Whole} \times \text{Denominator}) + \text{Numerator}}{\text{Denominator}}$$

$$1 \frac{1}{3} + 3 \frac{2}{3} = \frac{4}{3} + \frac{11}{3}$$

Since, the denominators of the given fractions are equal (L.C.M. of 3 and 3 is 3), we add the numerators to obtain the answer.

$$\therefore \frac{4}{3} + \frac{11}{3} = \frac{4 + 11}{3} = \frac{15}{3} = 5$$

Hence, the required answer is 5

(l) Given, $4 \frac{2}{3} + 3 \frac{1}{4}$

Converting the given mixed fractions to improper fractions:

$$\frac{(\text{Whole} \times \text{Denominator}) + \text{Numerator}}{\text{Denominator}}$$

$$4\frac{2}{3} + 3\frac{1}{4} = \frac{14}{3} + \frac{13}{4}$$

To add two unlike fractions, we first find the L.C.M. of their denominators.

L.C.M. of 3 and 4 is 12

$$\begin{aligned} \therefore \frac{14}{3} + \frac{13}{4} &= \frac{14 \times 4}{3 \times 4} + \frac{13 \times 3}{4 \times 3} \\ &= \frac{14 \times 4 + 13 \times 3}{12} \\ &= \frac{56 + 39}{12} = \frac{95}{12} = 7\frac{11}{12} \end{aligned}$$

Hence, the required fraction is $7\frac{11}{12}$

(m) Given, $\frac{16}{5} - \frac{7}{5}$

Like fractions have same denominator (L.C.M. of 5 and 5 is 5)

$$\begin{aligned} \therefore \frac{16}{5} - \frac{7}{5} &= \frac{16 - 7}{5} \\ &= \frac{9}{5} = 1\frac{4}{5} \end{aligned}$$

Hence, the required fraction is $1\frac{4}{5}$

(n) Given, $\frac{4}{3} - \frac{1}{2}$

To subtract two unlike fractions, we first find the L.C.M. of their denominators.

L.C.M. of 3 and 2 is 6

$$\begin{aligned} \therefore \frac{4}{3} - \frac{1}{2} &= \frac{4 \times 2 - 1 \times 3}{6} \\ &= \frac{8 - 3}{6} = \frac{5}{6} \end{aligned}$$

Hence, the required fraction is $\frac{5}{6}$

2. Sarita bought $\frac{2}{5}$ metre of ribbon and Lalita $\frac{3}{4}$ metre of ribbon. What is the total length of the ribbon they bought?

Solution:

Given,

Length of the ribbon bought by Sarita = $\frac{2}{5}$ m

Length of the ribbon bought by Lalita = $\frac{3}{4}$ m

Total length of ribbon = $\frac{2}{5} + \frac{3}{4}$

$$= \frac{2 \times 4}{5 \times 4} + \frac{3 \times 5}{4 \times 5} \quad [\because \text{L.C.M. of 5 and 4 is 20}]$$

$$= \frac{2 \times 4 + 3 \times 5}{20} \quad [\because \text{L.C.M. of 5 and 4 is 20}]$$

$$= \frac{8 + 15}{20} = \frac{23}{20} = 1\frac{3}{20} \text{ m}$$

Therefore, they bought $1\frac{3}{20}$ m of ribbon.

3. Naina was given $1\frac{1}{2}$ piece of cake and Najma was given $1\frac{1}{3}$ piece of cake. Find the total amount of cake was given to both of them.

Solution:

Given,

Fraction of cake given to Naina = $1\frac{1}{2}$

Fraction of cake given to Najma = $1\frac{1}{3}$

Total amount of cake given to them = $1\frac{1}{2} + 1\frac{1}{3}$

$$= \frac{3}{2} + \frac{4}{3}$$

$$= \frac{3 \times 3}{2 \times 3} + \frac{4 \times 2}{3 \times 2}$$

$$= \frac{3 \times 3 + 4 \times 2}{6} \quad [\because \text{L.C.M. of 2 and 3 is 6}]$$

$$= \frac{9 + 8}{6} = \frac{17}{6} = 2\frac{5}{6}$$

Therefore, the total amount of cake given to them = $2\frac{5}{6}$.

4. Fill in the boxes:

(A) $\square - \frac{5}{8} = \frac{1}{4}$

(B) $\square - \frac{1}{5} = \frac{1}{2}$

(C) $\frac{1}{2} - \square = \frac{1}{6}$

Solution:

(A) Given, $\square - \frac{5}{8} = \frac{1}{4}$

$$\square = \frac{1}{4} + \frac{5}{8}$$

$$= \frac{2 + 5}{8} = \frac{7}{8}$$

Hence, the required answer is $\frac{7}{8}$

(B) Given, $\square - \frac{1}{5} = \frac{1}{2}$

$$\square = \frac{1}{2} + \frac{1}{5}$$

$$= \frac{5 + 2}{10} = \frac{7}{10}$$

Hence, the required answer is $\frac{7}{10}$

(C) Given, $\frac{1}{2} - \square = \frac{1}{6}$

$$\square = \frac{1}{2} - \frac{1}{6}$$

$$= \frac{3 - 1}{6} = \frac{2}{6} = \frac{1}{3}$$

Hence, the required answer is $\frac{1}{3}$

5. Complete the addition-subtraction box.

(A)

	$\xrightarrow{\oplus}$		
	$\frac{2}{3}$	$\frac{4}{3}$	
$\downarrow \ominus$	$\frac{1}{3}$	$\frac{2}{3}$	

(B)

	⊕ →		
↓ ⊖	$\frac{1}{2}$	$\frac{1}{3}$	
	$\frac{1}{3}$	$\frac{1}{4}$	

Solution:

From the given figure,

$$\frac{2}{3} + \frac{4}{3} = \frac{6}{3} = 2$$

$$\frac{1}{3} + \frac{2}{3} = \frac{3}{3} = 1$$

	⊕ →		
↓ ⊖	$\frac{2}{3}$	$\frac{4}{3}$	2
	$\frac{1}{3}$	$\frac{2}{3}$	1

$$\frac{2}{3} - \frac{1}{3} = \frac{1}{3}$$

$$\frac{4}{3} - \frac{2}{3} = \frac{2}{3}$$

	⊕ →		
↓ ⊖	$\frac{2}{3}$	$\frac{4}{3}$	2
	$\frac{1}{3}$	$\frac{2}{3}$	1
	$\frac{1}{3}$	$\frac{2}{3}$	

Now, $2 - 1 = 1$

Also, $\frac{1}{3} + \frac{2}{3} = 1$

	⊕ →		
	$\frac{2}{3}$	$\frac{4}{3}$	2
⊖ ↓	$\frac{1}{3}$	$\frac{2}{3}$	1
	$\frac{1}{3}$	$\frac{2}{3}$	1

Therefore, the completed box is given as above.

From the given figure,

$$\frac{1}{2} + \frac{1}{3} = \frac{3+2}{6} = \frac{5}{6}$$

$$\frac{1}{3} + \frac{1}{4} = \frac{4+3}{12} = \frac{7}{12}$$

$$\frac{1}{2} - \frac{1}{3} = \frac{3-2}{6} = \frac{1}{6}$$

$$\frac{1}{3} - \frac{1}{4} = \frac{4-3}{12} = \frac{1}{12}$$

	⊕ →		
	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{5}{6}$
⊖ ↓	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{7}{12}$
	$\frac{1}{6}$	$\frac{1}{12}$	

$$\therefore \frac{1}{6} + \frac{1}{12} = \frac{2+1}{12} = \frac{1}{4}$$

	⊕ →		
	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{5}{6}$
⊖ ↓	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{7}{12}$
	$\frac{1}{6}$	$\frac{1}{12}$	$\frac{1}{4}$

Therefore, the completed box is given as above.

6. A piece of wire $\frac{7}{8}$ metre long broke into two pieces. One piece was $\frac{1}{4}$ metre long. How long is the other piece?

Solution:

Given,

$$\text{Total length of wire} = \frac{7}{8} \text{ meter}$$

$$\text{Length of first part} = \frac{1}{4} \text{ meter}$$

Remaining part = Total length of the wire - Length of the first part

$$= \frac{7}{8} - \frac{1}{4}$$

$$= \frac{7 \times 1 - 2 \times 1}{8} \quad [\because \text{L.C.M. of 8 and 4 is 8}]$$

$$= \frac{7-2}{8} = \frac{5}{8} \text{ meter}$$

Therefore, the length of remaining part is $\frac{5}{8}$ meter.

7. Nandini's house is $\frac{9}{10}$ km from her school. She walked some distance and then took a bus for

$\frac{1}{2}$ km to reach the school. How far did she walk?

Solution:

Given,

$$\text{Total distance between school and house} = \frac{9}{10} \text{ km}$$

$$\text{Distance she travelled by bus} = \frac{1}{2} \text{ km}$$

$$\text{Therefore, the distance she walks} = \frac{9}{10} - \frac{1}{2}$$

$$= \frac{9 \times 1 - 1 \times 5}{10} \quad [\because \text{L.C.M. of 10 and 2 is 10}]$$

$$= \frac{9-5}{10}$$

$$= \frac{4}{10}$$

$$= \frac{2}{5} \text{ km}$$

Hence, the distance covered by walking is $\frac{2}{5}$ km

8. Asha and Samuel have bookshelves of the same size partly filled with books. Asha's shelf is

$\frac{5}{6}$ th full and Samuel's shelf is $\frac{2}{5}$ th full. Whose bookshelf is fuller? By what fraction?

Solution:

Given,

Asha's bookshelf is $\frac{5}{6}$ th full

Samuel's bookshelf is $\frac{2}{5}$ th full

In order to compare the two fractions, we find their equivalent fractions with same denominator.

$$\Rightarrow \frac{5}{6} \times \frac{5}{5} = \frac{25}{30}$$

$$\text{Also, } \frac{2}{5} \times \frac{6}{6} = \frac{12}{30} \text{ [}\because \text{L.C.M. of 6 and 5 is 30]}]$$

$$\therefore \frac{25}{30} > \frac{12}{30}$$

$$\Rightarrow \frac{5}{6} > \frac{2}{5}$$

\therefore Asha's bookshelf is more covered than Samuel's.

$$\text{Difference} = \frac{25}{30} - \frac{12}{30} = \frac{13}{30}$$

Hence, Asha's bookshelf is more covered than Samuel's by a fraction of $\frac{13}{30}$.

9. Jaidev takes $2\frac{1}{5}$ minutes to walk across the school ground. Rahul takes $\frac{7}{4}$ minutes to do the same. Who takes less time and by what fraction?

Solution:

Given,

$$\text{Time taken by Jaidev} = 2\frac{1}{5} \text{ minutes} = \frac{5 \times 2 + 1}{5} = \frac{11}{5} \text{ minutes}$$

$$\text{Time taken by Rahul} = \frac{7}{4} \text{ minutes}$$

In order to compare the two fractions, we find their equivalent fractions with same denominator.

$$\frac{11}{5} = \frac{11 \times 4}{5 \times 4} = \frac{44}{20}$$

$$\frac{7}{4} = \frac{7 \times 5}{4 \times 5} = \frac{35}{20}$$

$$\text{Since, } \frac{44}{20} > \frac{35}{20}$$

$$\Rightarrow \frac{11}{5} > \frac{7}{4}$$

Therefore, Rahul takes less time.

$$\text{Difference} = \frac{11}{5} - \frac{7}{4} = \frac{11 \times 4 - 7 \times 5}{20} [\because \text{L.C.M. of 5 and 4 is 20}]$$

$$= \frac{44 - 35}{20}$$

$$= \frac{9}{20} \text{ minutes}$$

Thus, Rahul takes $\frac{9}{20}$ minutes lesser than Jaidev.