Chapter 7

Fraction

SOLUTIONS:

Exercise 7.1

1. Write the fraction representing the shaded portion.
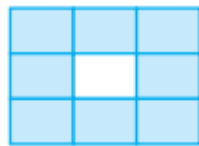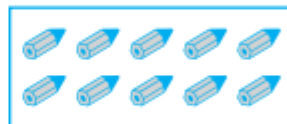

Solutions:

i.   Total number of parts = 4

Parts shaded = 2

Fraction = 2/4

ii.   Total number of parts = 9

Parts shaded = 8

Fraction = 8/9

iii. Total number of parts = 8

Parts shaded = 4

Fraction = 4/8

iv. Total number of parts = 4

Parts shaded = 1

Fraction = 1/4

v. Total number of parts = 7

Parts shaded = 3

Fraction = 3/7

vi. Total number of parts = 12

Parts shaded = 9

Fraction = 9/12

vii. Total number of parts = 10

Parts shaded = 0

Fraction = 0/10

viii. Total number of parts = 9

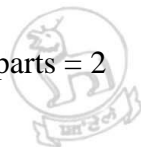Parts shaded = 4

Fraction = 4/9

ix. Total number of parts = 8

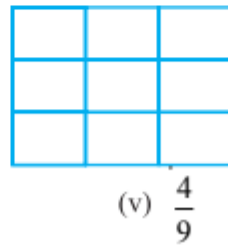Parts shaded = 4

Fraction = 4/8

x. Total number of parts = 2

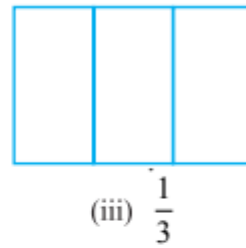Parts shaded = 1

Fraction = ½

2.	**Colour the part according to the given fraction.**

(i) $\dfrac{1}{6}$	(ii) $\dfrac{1}{4}$	(iii) $\dfrac{1}{3}$

(iv) $\dfrac{3}{4}$	(v) $\dfrac{4}{9}$

Solutions:

(i) $\dfrac{1}{6}$	(ii) $\dfrac{1}{4}$	(iii) $\dfrac{1}{3}$

(iv) $\dfrac{3}{4}$	(v) $\dfrac{4}{9}$
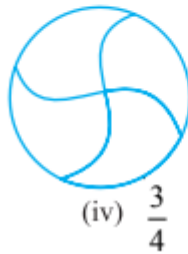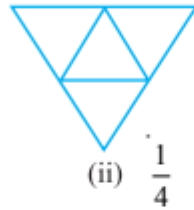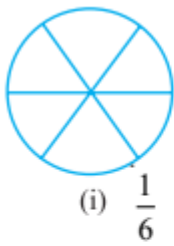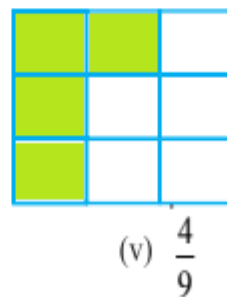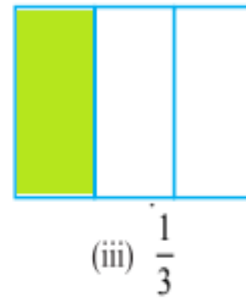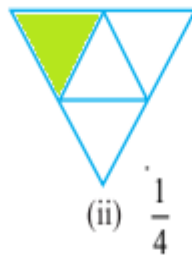
3.   **Identify the error, if any.**
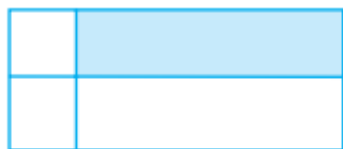
Solutions:

(i), (ii), and (iii) The shaded parts do not represent to the given fraction.

4.   **What fraction of a day is 8 hours?**

Solutions:

1 day = 24 hours

Required fraction = 8/24

5.   **What fraction of an hour is 40 minutes?**

Solutions:

1 hour = 60 minutes

Therefore required fraction = 40/60

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?**

Solutions:

   a) **Arya will divide each sandwich into three equal parts and give one part of each sandwich to each one of them.**
   b) 1/3 of a sandwich will be received by each boy.

7.   Kanchan dyes dresses. She had to dye 30 dresses. She has so far finished 20 dresses. What fraction of dresses has she finished?

Solutions:

Total number of dresses to be dyed = 30

Numbers of dresses finished dying = 20

Fraction of finished dresses drying = 20/30 = 2/3

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

Solutions:

Natural numbers from 2 to 12 are 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

Prime numbers out of the above numbers are 2, 3, 5, 7 and 11

Total number of prime numbers = 5

∴ Required fraction = 5/11

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

Solutions:

Natural numbers from 102 to 113 are

102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113(They are 12 in number)

Prime numbers out of the above numbers are 103, 107, 109, 113. (They are 4 in numbers)

∴Required ratio = 4/12

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

Solution:

Total number of given circle = 8

Number of circle with X's in them = 4

∴Required ratio = 4/8 = 1/2

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?**
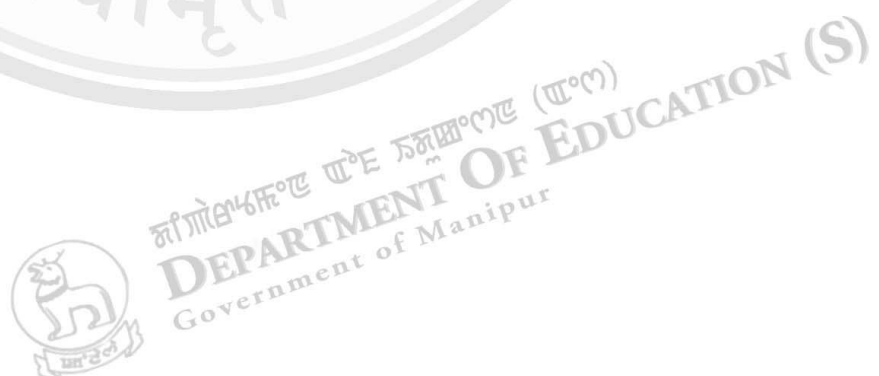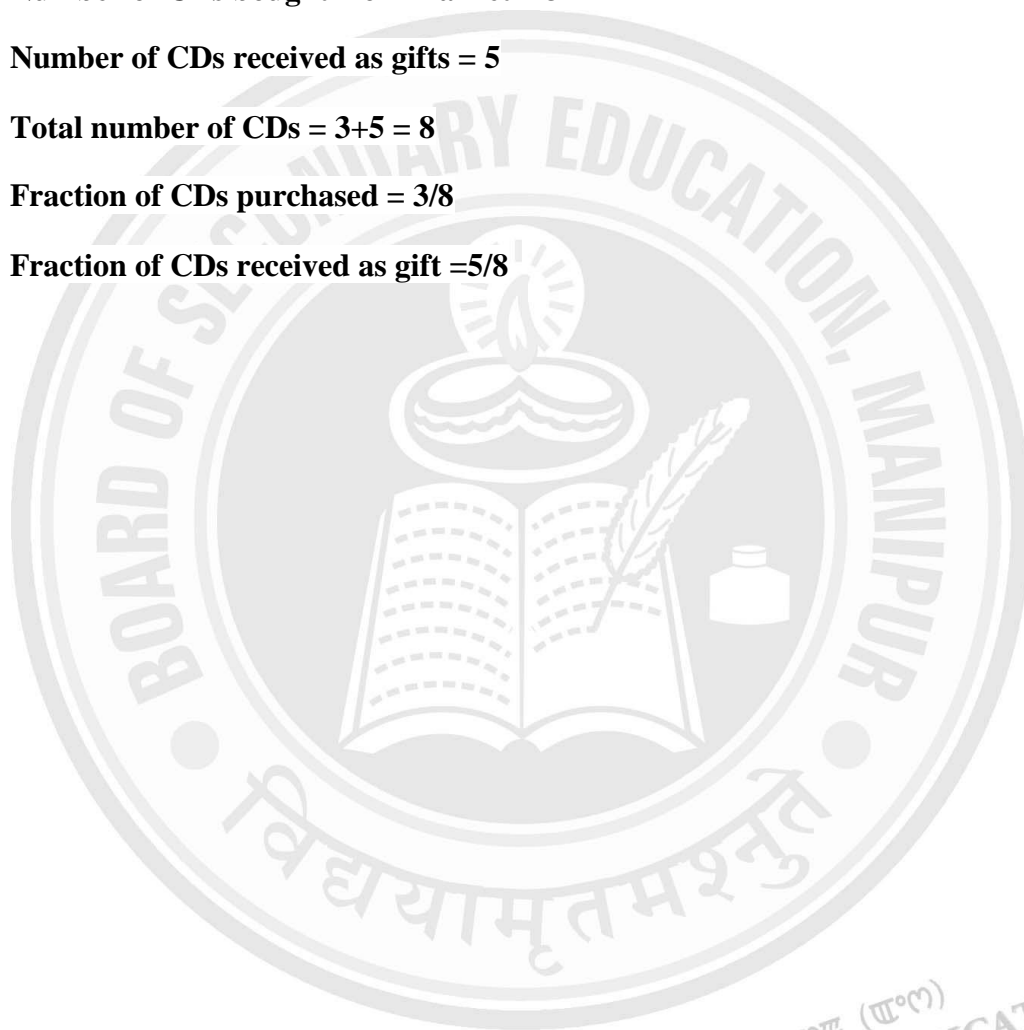
Solution:

Number of CDs bought from market = 3

Number of CDs received as gifts = 5

Total number of CDs = 3+5 = 8

Fraction of CDs purchased = 3/8

Fraction of CDs received as gift =5/8

Exercise 7.2

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

(a) 1 / 2,   1 / 4,   3 / 4,   4 / 4

(b) 1 / 8,   2 / 8,   3 / 8,   7 / 8

(c) 2 / 5,   3 / 5,   8 / 5,   4 / 5

Solutions:

(a) We have,

½ = 2/4, 1/4, 3/4, 4/4(=1)
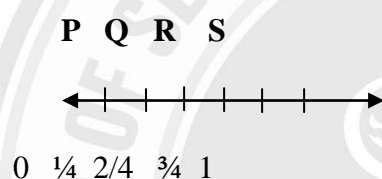
From the figure we know,

¼ is denoted by point P

½ is denoted by point Q [Since **½ = 2/4**]

¾ is denoted by point R

4/4 is denoted by point S [Since 1 = 4/4]

(b) We have,

1/8, 2/8, 3/8, 7/8
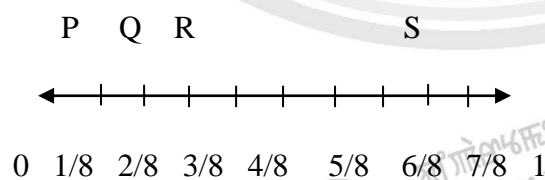
1/8 is denoted by point P

2/8 is denoted by point Q

3/8 is denoted by point R

7/8 is denoted by point S.

(c) We have,

2/5, 3/5, 4/5, 8/5
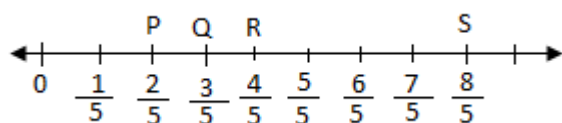
2/5 is denoted by point P

3/5 is denoted by point Q

4/5 is denoted by point R

8/5 is denoted by point S.

2.   Express the following as mixed fractions:

(a)   **20 / 3**

(b)   **11 / 5**

(c)   **17 / 7**

(d)   **28 / 5**

(e)   **19 / 6**

(f)   **35 / 9**

Solutions:

(a) 20 / 3

$$3\overline{)20} \;\; 6$$

$$\underline{18}$$

$$2$$

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

(b) 11/5

$$5\overline{\big)11\big(2}$$
$$\underline{10}$$
$$1$$

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

(c) 17 /7

$$7\overline{\big)17\big(2}$$
$$\underline{14}$$
$$3$$

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

(d) 28 / 5

$$5\overline{\big)28\big(5}$$
$$\underline{25}$$
$$3$$

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

(e) 19/ 6

$$6\overline{\big)19\big(3}$$
$$\underline{18}$$
$$1$$

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

(f) 35 / 9

$$9\overline{)\begin{array}{l}3\\35\\27\\\hline8\end{array}}$$

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

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

Solutions:

(a)

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

$$= \frac{7 \times 4 + 3}{4}$$

$$= \frac{28 + 3}{4}$$

$$= \frac{31}{4}$$

(b)

$$5\frac{6}{7}$$

$$= \frac{5 \times 7 + 6}{7}$$

$$= \frac{35 + 6}{7}$$

$$= \frac{41}{7}$$

(c)

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

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

$$= \frac{12 + 5}{6}$$

$$= \frac{17}{6}$$

(d)

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

$$= \frac{10 \times 5 + 3}{5}$$

$$= \frac{50 + 3}{5}$$

$$= \frac{53}{5}$$

(e)

$$9\frac{3}{7}$$

$$= \frac{9 \times 7 + 3}{7}$$

$$= \frac{63 + 3}{7}$$

$$= \frac{66}{7}$$

(f)

$$8 \frac{4}{9}$$

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

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

$$= \frac{76}{9}$$
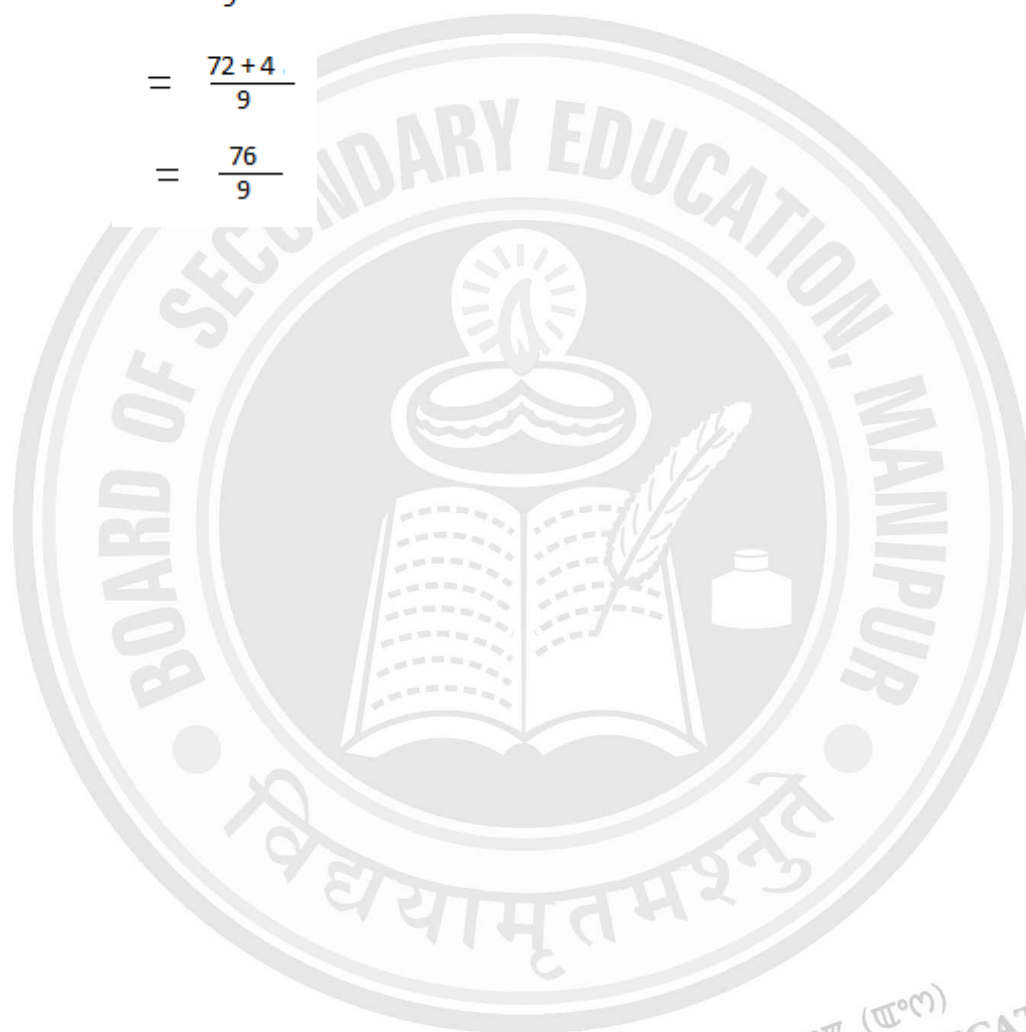
Exercise 7.3

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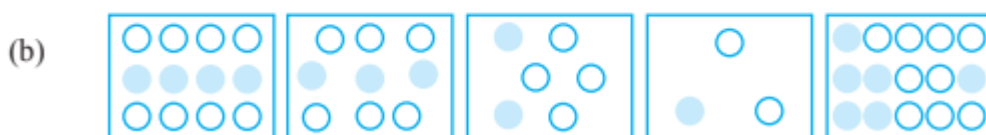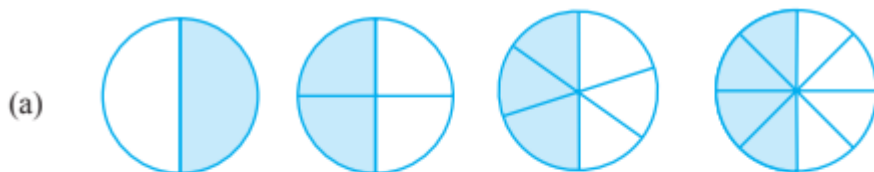
Solutions:

(a) Fraction represented by shaded part

  i.   1/2
  ii.   2/4 = 1/2
  iii. 3/6 = 1/2
  iv.   4/8 = 1/2

Hence, all the fractions are equal

(b) Fraction represented by shaded part

  i.   4/12 = 1/3
  ii.   3/9 = 1/3
  iii. 2/6 = 1/3
  iv.   1/3
  v.   6/15 = 2/5

All the fractions are not equivalent.

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

(a)   (b)   (c)   (d)   (e)

(i)   (ii)   (iii)   (iv)   (v)
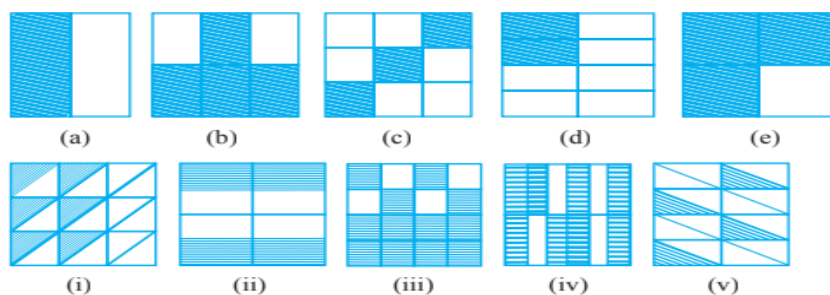
Solutions:

Fractions represent by figures given in 1st row are

a) ½
b) $4/6 = 2/3$
c) $3/9 = 1/3$
d) $2/8 = ¼$
e) ¾

Fraction represent by figures given in 2nd row are

   i. $6/18 = 1/3$
  ii. $4/8 = ½$
 iii. $12/16 = ¾$
 iv. $8/12 = 2/3$
  v. $4/16 = ¼$

    ∴ Equivalent fractions are

a) --- (ii)
b) ---(iv)
c) ---(i)
d) ---(v)
e) ---(iii)

3. **Replace ☐ in each of the following by the correct number:**

(a) $\dfrac{2}{7} = \dfrac{8}{☐}$ (b) $\dfrac{5}{8} = \dfrac{10}{☐}$ (c) $\dfrac{3}{5} = \dfrac{☐}{20}$ (d) $\dfrac{45}{60} = \dfrac{15}{☐}$ (e) $\dfrac{18}{24} = \dfrac{☐}{4}$

Solutions:

(a)

$$\dfrac{2}{7} = \dfrac{8}{☐}$$

$$2 \times ☐ = 8 \times 7$$

$$☐ = \dfrac{8 \times 7}{2}$$

$$☐ = \dfrac{56}{2}$$

$$☐ = 28$$

(b)

$$\dfrac{5}{8} = \dfrac{10}{☐}$$

$$5 \times ☐ = 10 \times 8$$

$$☐ = \dfrac{10 \times 8}{5}$$

$$☐ = \dfrac{80}{5}$$

$$☐ = 16$$

(c)

$$\frac{3}{5} = \frac{\square}{20}$$

$$5 \times \square = 20 \times 3$$

$$\square = \frac{20 \times 3}{5}$$

$$\square = \frac{60}{5}$$

$$\square = 12$$

(d)

$$\frac{45}{60} = \frac{15}{\square}$$

$$45 \times \square = 15 \times 60$$

$$\square = \frac{15 \times 60}{45}$$

$$\square = \frac{60}{3}$$

$$\square = 20$$

(e)

$$\frac{18}{24} = \frac{\square}{4}$$

$$24 \times \square = 18 \times 4$$

$$\square = \frac{18 \times 4}{24}$$

$$\square = \frac{72}{24}$$

$$\square = 3$$

4.   **Find the equivalent fraction of 3 / 5 having**

(a)   denominator 20

(b)   **numerator 9**

(c)   **denominator 30**

(d)   **numerator 27**

Solutions:

a) $3/5 = \dfrac{3 x 4}{5 x 4} = \dfrac{12}{20}$

b) $3/5 = \dfrac{3 x 3}{5 x 3} = \dfrac{9}{15}$

c) $3/5 = \dfrac{3 x 6}{5 x 6} = \dfrac{18}{30}$

d) $3/5 = \dfrac{3 x 9}{5 x 9} = \dfrac{27}{45}$

5.   **Find the equivalent fraction of 36/48 with**

(a) numerator 9

(b) denominator 4

Solutions:

a) $\dfrac{9}{D} = \dfrac{36}{48}$

36 x D = 48 x 9

D $= \dfrac{48 \, x 9}{36}$

D $= \dfrac{432}{36}$

D= 12

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

b) **N/4 = 36/48**

N x 48 = 36 x 4

N = (36 x 4)/48

N = 144/48

N = 3

Hence, the equivalent fraction is 3/4

6. **Check whether the given fractions are equivalent:**

(a) **5 / 9, 30 / 54**

(b) **3 / 10, 12 / 50**

(c) **7 / 13, 5 / 11**

Solutions:

(a). 5/9, 30/54

5 x 54 = 270

30 x 9 = 270

Hence, 5/9 and 30/54 are equivalent fractions.

(b). 3/10, 12/50

3 x 50 = 150

12 x 10 = 120

Hence, 3/10 and 12/50 are not equivalent fractions.

(c). 7/13, 5/11

7 x11 = 77

5 x 13 =65

Hence, 7/13 and 5/11 are not equivalent fractions.

7. **Reduce the following fractions to simplest form:**

(a) **48 / 60**

(b) **150 / 60**

(c) **84 / 98**

(d) **12 / 52**

(e) **7 / 28**

Solutions:

(a) 48/60

48 = 2 x 2 x 2 x 2 x 3

60 = 2 x 2 x 3 x 5

H.C.F of 48 and 60 = 2 x2 x 3 = 12

48/60= $\frac{\frac{48}{12}}{\frac{60}{12}}$= 4/5 which is the simplest form

(b) 150/60

150 = 3 x 5 x 2 x 5

60 = 3 x 2 x 2 x 5

H.C.F of 150 and 60 = 2 x 3 x 5 = 30

150/60 = (150/30) / (60 /30) = 5/2 which is the simplest form.

(c) 84/98

84 = 2 x 2 x 3 x 7

98 = 2 x 7 x 7

H.C.F of 84 and 98 = 2 x 7 = 14

84/98 = (84/14) / (98/14) = 6/7 which is the simplest form.

(d) 12/52

12 = 2 x 2 x 3

52 = 2 x 2 x 13

H.C.F of 12 and 52 = 2 x 2 = 4

12/52 = (12/4)/ (52/4) = 3/13 which is the simplest form.

(e) 7/28

7 = 7 x 1

28 = 2 x 7 x 2

H.C.F of 7 and 28 = 7

7/28 = (7/7) / (28/7) = ¼ which is the smallest form.

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:

Fraction of pencils used by Ramesh

Total pencils = 20

He used up = 10 pencils

Required fraction = 10/20 = ½

Fraction of pencils used by Sheelu

Total pencils = 50

She used up = 25 pencils

Required fraction = 25/50 = ½

Fraction of pencils used by Jamaal

Total pencils = 80

He used up = 40 pencils

Required fraction = 40/80 = ½

∴ each fraction is equal.

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

i.	250/400	(a)	2/3
ii.	180/200	(b)	2/5
iii.	660/990	(c)	1/ 2
iv.	180/360	(d)	5/8
v.	220/550	(e)	9/10

Solutions:

(i) 250/400

25 = **5** x 5

40 = **5** x 2 x 2 x 2

H.C.F of 25 and 40 = 5

25/40 = (25/5) / (40/5) = 5/8

(ii) 180/200

18 = **2** x 3 x 3

20 = 5 x **2** x 2

H.C.F of 18 and 20 = 2

18/20 = (18/2) / (20/2) = 9/10

(iii) 660/990

(66 /11) / (99/11) = 6/9

6 = 2 x **3**

9 = **3** x 3

H.C.F of 6 and 9 = 3

6/9 = (6/3) / (9/3) = 2/3

(iv) 18̸0/36̸0

(18/9) / (36/9) = 2/4

2 = **2** x 1

4 = **2** x 2

H.C.F of 2 and 4 = 2

2/4 = (2/2) / (4/2) = ½

(v) 22̸0/55̸0

(22/11) / (55/11) = 2/5

2 = 2 x **1**

5 = 5 x **1**

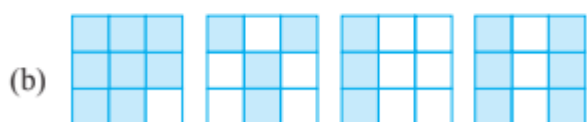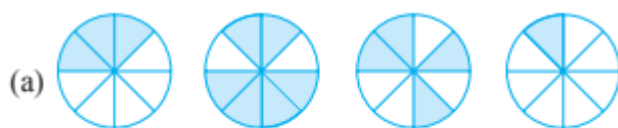H.C.F of 2 and 5 = 1

2/5 = (2/1) / (5/1) = 2/5

∴The equivalent fractions are

i.   250 / 400 = (d) 5 / 8
ii. 180 / 200 = (e) 9 / 10
iii. 660 / 990 = (a) 2 / 3
iv. 180 / 360 = (c) 1 / 2
v.   220 / 550 = (b) 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.

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

Solutions:

(a) 3/8, 6/8, 4/8, 1/8

    i.   Arrange them in ascending order:

    1/8< 3/8<4/8<6/8

    ii.   Arrange them in descending order:

    6/8> 4/8> 3/8 >1/8

(b) 8/9, 4/9, 3/9, 6/9

    i.   Arrange them in ascending order:

    3/9 < 4/9 < 6/9 < 8/9

    ii.   Arrange them in descending order:

    8/9>6/9>4/9>3/9

(c)
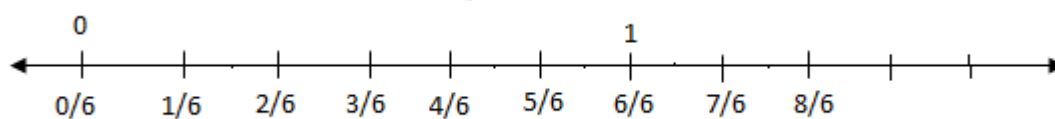
    5/6>2/6,   3/6>0/6, 1/6<6/6, 8/6>5/6

2. Compare the fractions and put an appropriate sign.

   a) **3 / 6 ☐ 5 / 6**
   b) **1 / 7 ☐ 1 / 4**
   c) **4 / 5 ☐ 5 / 5**
   d) **3 / 5 ☐ 3 / 7**

Solutions:

   a) **3 / 6 < 5 / 6 as 3<5**
   b) **1/7 <   1/4 as 4 parts of 1 will be more than 7 parts [or if Numerators are same, then the fraction with smaller denominator will be greater]**
   c) 4/5 < 5/5 as 4 < 5
   d) 3/5 > 3/7 as 5 parts of 3 will be more than 7 parts of 3

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

Solutions:

Five more examples are:

   i.   **4/6 < 3/6**
  ii.   **10/7 < 10/2**
 iii.   **3/5 < 6/5**
  iv.   **5/7 >5/8**
   v.   **7/10 < 9/10**
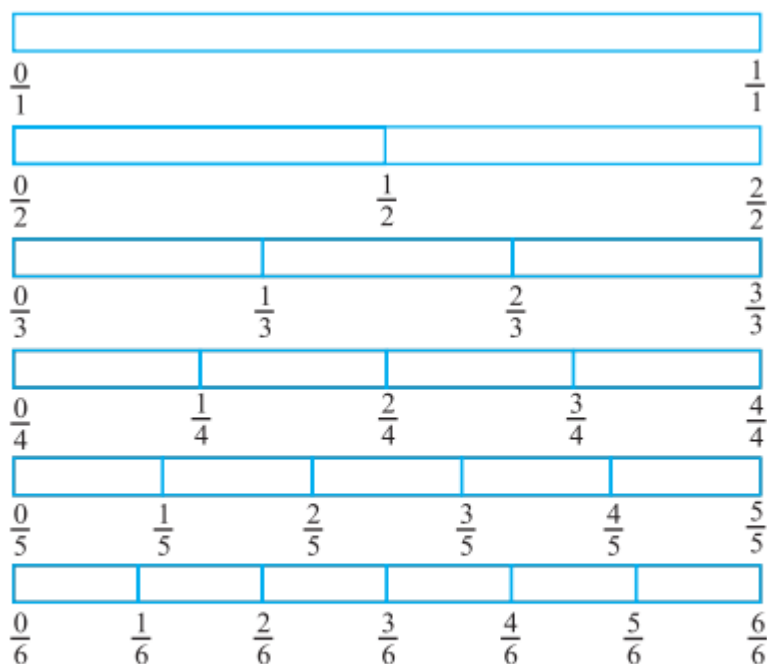
4. Look at the figures and write '<' or '>', '=' between the given pairs of fractions.

(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.

Solutions:

a) $1/6 < 1/3$ (1/6 is on the left of 1/3)
b) $¾ > 2/6$ (¾ is on the left of 2/6)
c) $2/3 > 2/4$ (2/3 is on the left of 2/4)
d) $6/6 = 3/3$ (6/6 and 3/3 are at the same point)
e) $5/6 < 5/5$ (5/6 lies on the left of 5/5)

5 more such problems are as follows:

i. $2/5 < 2/3$
ii. $3/7 < 5/6$
iii. $4/5 > 2/4$
iv. $0/8 = 0/5$
v. $¾ > 2/7$

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

a) $1/2 \square 1/5$
b) $2/4 \square 3/6$

c) **3 / 5 ☐ 2 / 3**

d) **3 / 4 ☐ 2 / 8**

e) **3 / 5 ☐ 6 / 5**

f) **7 / 9 ☐ 3 / 9**

g) **1 / 4 ☐ 2 / 8**

h) **6 / 10 ☐ 4 / 5**

i) **3 / 4 ☐ 7 / 8**

j) **6 / 10 ☐ 3 / 5**

k) **5 / 7 ☐ 15 / 21**

Solutions:

We will use the cross – product method to calculate quickly.

a) 1 / 2 ☐ 1 / 5

1 x 5 = 5 ☐ 1 x 2 = 2

∴ ½ > 1/5

b) 2 / 4 ☐ 3 / 6

2 x6 = 12 ☐4 x3 = 12

∴ 2/4 = 3/6

c) 3 / 5 ☐ 2 / 3

3 x 3 = 9 ☐5 x 2 = 10

∴ 3/5 < 2/3

d) 3 / 4 ☐ 2 / 8

3 x 8 = 24 ☐4 x 2 = 8

∴ ¾ > 2/8

e)3 / 5 ☐ 6 / 5

3 x 5 = 15 ☐5 x 6 = 30

∴ 3/5 < 6/5

f) 7 / 9 ☐ 3 / 9

7 x 9 = 63 ☐3 x 9 = 27

∴ **7/9 >3/9**

g) 1 / 4 ☐ 2 / 8

1 x 8 =8 ☐4 x 2 = 8

∴ **¼ = 2/8**

h) 6 / 10 ☐ 4 / 5

6 x 5 = 30 ☐ 10 x 4 = 40

∴ **6/10 < 4/5**

i) 3 / 4 ☐ 7 / 8

3 x 8 = 24 ☐4 x 7 = 28

∴ **¾ < 7/8**

j) 6 / 10 ☐ 3 / 5

6 x 5 = 30 ☐10 x 3 = 30

∴ **6/10 = 3/5**

k) 5 / 7 ☐ 15 / 21

5 x 21 = 105 ☐7 x 15 = 105

∴ **5/7 = 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) 2 / 12   **(b) 3 / 15**   **(c) 8 / 50**   **(d) 16 / 100**   **(e) 10 / 60**   **(f) 15 / 75**

(g) 12 / 60   **(h) 16 / 96**   **(i) 12 / 75**   **(j) 12 / 72**   **(k) 3 / 18**   **(l) 4 / 25**

Solutions:

a) **2/12 = 2÷2/12÷2 = 1/6**   (**Since H.C.F of 2 and 12 is 2)**
b) **3/15 = 3÷3 / 15÷3 = 1/5**   **(Since H.C.F of 3 and 15 is 3)**
c) **8/50 = 8÷2 / 50÷2 = 4/25**   **(Since H.C.F of 8 and 50 is 2)**
d) **16/100 = 16÷4 / 100÷4 =4/25** **(Since H.C.F of 16 and 100 is 4)**
e) **10/60 = 10÷10 / 60÷10 = 1/6** **(Since H.C.F of 10 and 60 is 10)**
f) **15/75 = 15÷15 / 75÷15 = 1/5** **(Since H.C.F of 15 and 75 is 15)**
g) **12/60 = 12÷12 / 60÷12 = 1/5** **(Since H.C.F of 12 and 60 is 12)**
h) **16/96 = 16÷16 /96÷16 = 1/6** **(Since H.C.F of 16 and 96 is 16)**
i) **12/75 = 12÷3/ 75÷3 = 4/25**   **(Since H.C.F of 12 and 75 is 3)**

j) **12/72 = 12÷12 / 72÷12 = 1/6** (Since H.C.F of 12 and 72 is 12)

k) **3/18 = 3÷3 / 18÷3 = 1/6** (Since H.C.F of 3 and 18 is 3)

l) **4/25 = 4÷1/25÷1 = 4/25** (Since H.C.F of 4 and 25 is 1)

Grouping the fractions we have,

i. **2/12 = 10/60 = 16/96 = 12/72 = 3/18 (each is equal to 1/6)**

ii. **3/15 = 15/75 = 12/60 (each is equal to 1/5)**

iii. **8/50 = 16/100 = 12/75 = 4/25 (each is equal to 4/25)**

Group (i) a, e, h, j, k

Group (ii) b, f, g

Group (iii) c, d, i, l

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

a) **Is 5 / 9 equal to 4 / 5?**

b) **Is 9 / 16 equal to 5 / 9?**

c) **Is 4 /5 equal to 16 / 20?**

d) **Is 1 / 15 equal to 4 / 30?**

Solutions:

a) 5/9 and 4/5

5/9 = (5 x 5) / (9x 5) = 25/45

4/5 = (4 x 9) / (5 x 9) = 36/45

Hence 5/9 and 4/5 are not equal.

b) 9/16 and 5/9

9/16 = (9 x 9)/ (16 x 9) = 81/144

5/9 = (5 x 16) / (9 x 16) = 80/144

Hence 9/16 and 5/9 are not equal.

c) 4/5 and 16/20

4/5 = (4 x 20) / (5 x 20) = 80/100

16/20 = (16 x 5) / (20 x 5) = 80/ 100

Hence 4/5 and 16/20 are equal.

d) 1/15 and 4/30

1/15 = (1 X30) / (15 x 30) = 30/450

4/30 = (4 x 15) / (30 x 15) = 60/450

Hence 1/15 and 4/30 are not equal.

8. Ila read 25 pages of a book containing 100 pages. Lalita read 2 / 5 of the same book. Who read less?

Solutions:

Total number of pages in the book = 100

Pages read by Ila = 25

Pages read by Lalita = 2/5 x 100 = 40

Since 25 < 40, Ila has read less pages.

9. Rafiq exercised for 3 / 6 of an hour, while Rohit exercised for 3 / 4 of an hour. Who exercised for a longer time?

Solutions:

Rafiq exercised 3/6 hours

Rohit exercised ¾ hours

By comparing 3/6 and ¾

We have, 3/6 < ¾

Hence, 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?

Solutions:

Total number of students in class A = 25

Number of students passed in first class = 20

In class A, fraction of students who get 1ˢᵗ division = 20/25 = (20÷5)/ (25÷5) = 4/5
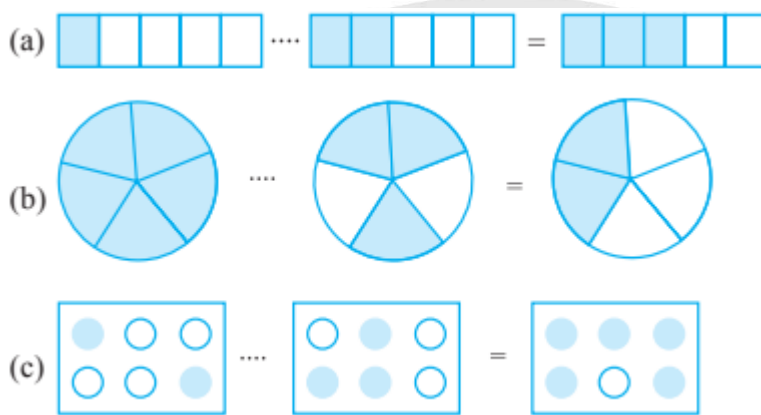
Total number of students in class B = 30

Number of students passed in first class = 24

In class B, fraction of students who get 1ˢᵗ division = 24/30 = (24÷6) / (30÷6) = 4/5

Therefore, the same fraction 4/5 of students got first class in both the classes.

Exercise 7.5

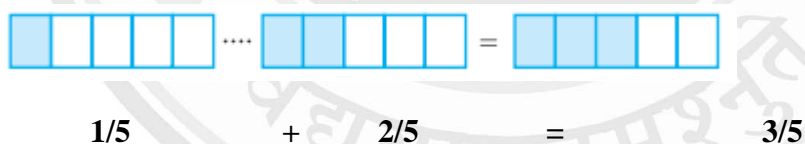**1. Write these fractions appropriately as additions or subtractions:**

Solutions:

(a) The given figure represents an addition of 1/5 and 2/5 pictorially i.e.

1/5 + 2/5 = 3/5

Given figure

    1/5   **+**   **2/5**   **=**   **3/5**

(b) The given figure represents a subtraction of 3/5 from 1

i.e.   1- 3/5 = 2/5

Given figure

    1   **-**   **3/5**   **=**   **2/5**
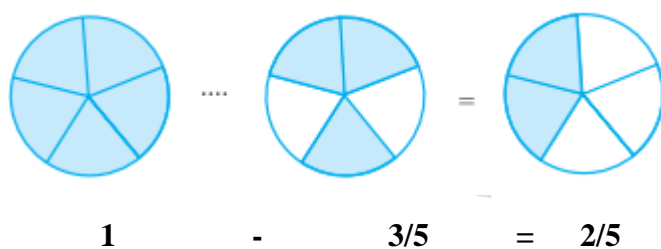
(c) The given figure represents addition of 2/6 and 3/6

i.e.   2/6 + 3/6 = 5/6

Given figure
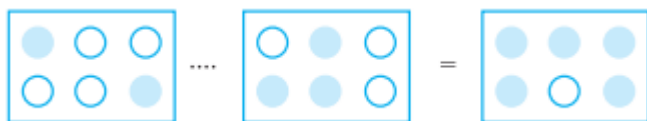
2/6   **+**   **3/6**   **=**   **5/6**

2. Solve:

(a) 1 / 18 + 1 / 18

(b) 8 / 15 + 3 / 15

(c) 7 / 7 – 5 / 7

(d) 1 / 22 + 21 / 22

(e) 12 / 15 – 7 / 15

(f) 5 / 8 + 3 / 8

(g) 1 – 2 / 3 (1 = 3 / 3)

(h) 1 / 4 + 0 / 4

(i) 3 – 12 / 5

Solutions:

(a) 1/18 + 1/18

= (1+1)/18

= (2÷2) / (18÷2)

= 1/9

(b) 8/15 + 3/15

= (8 + 3)/ 15

= 11/15

(c) 7/7 – 5/7

= (7-5)/7

= 2/7

(d) 1/22 + 21/22

= (1 +21)/22

= (22÷22)/ (22÷22)

=1/1

=1

(e) 12/15 – 7/15

= (12-7)/15

= (5÷5)/ (15÷5)

= 1/3

(f) 5/8 + 3/8

= (5 + 3)/8

= (8÷8) / (8÷8)

=1/1

=1

(g) 1 – 2 / 3 (1 = 3 / 3)

= 3/3 – 2/3

= (3-2)/3

= 1/3

(h) ¼ +0/4

= (1+ 0)/4

= ¼

(i) 3 - 12/5

= 15 / 5 – 12/ 5

= (15 – 12) / 5

= 3 / 5

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

Solution:

Part of the wall painted by Shubham = 2/3

Part of the wall painted by Madhabi = 1/3

Wall painted by together = 2/3 + 1/3

$$= (2+1)/3$$

$$= 3/3$$

$$= 1$$

∴ Shubham and Madhavi together painted 1 complete wall in a room.

4. Fill in the missing fractions.

(a)   7 / 10 –   = 3 / 10

(b)   – 3 ⬜ 21 = 5 ⬜ 21

(c)   – 3 ⬜ 6 = 3 / 6

(d)   + 5 ⬜ 27 = 12 / 27

Solutions:

(a) 7 /10 – ⬜ = 3 / 10

7/10 -3/10 = ⬜

4/10 = ⬜

    ⬜ = 4/10

(b) ⬜ – 3 / 21 = 5 / 21

⬜ = 5/21 + 3/21

⬜ = (5+3)/21

⬜ = 8/21

(c) ☐ − 3 / 6 = 3 / 6

☐ = 3/6 + 3/6

☐ = (3 + 3)/6

☐ = 6/6

☐ = 1

(d) ☐ + 5 / 27 = 12 / 27

☐ = 12/27 − 5/27

☐ = (12 − 5)/27

☐ = 7/27

5. Javed was given 5 / 7 of a basket of oranges. What fraction of oranges was left in the basket?

Solutions:

Part of oranges given by Javed = 5/7

Part of oranges left in the basket

= 1 -5/7

=7/7 − 5/7

= (7 − 5)/7

= 2/7

∴ 2/7 part of oranges was left in the basket.

Exercise 7.6

1.Solve

(a) 2 / 3 + 1 / 7

Solution:

L.C.M of 3 and 7 = 21

2/3 = (2 x 7)/ (3 x 7) =14/21

1/7 = (1 x 3/ (7 X 3) = 3/21

2/3 + 1/7 = 14/21 + 3/21 = 17/21

(b) 3 / 10 + 7 / 15

Solution:

L.C.M of 10 and 15 = 5 x 2 x 3 = 30

3/10 = (3 x 3)/ (10 x 3) = 9/30

7/15 = (7 x 2)/ (15 x 2) = 14/30

3/10 + 7/15 = 9/30 + 14/30 = 23/30

(c) 4 / 9 + 2 / 7

Solution:

L.C.M of 9 and 7 = 9 x 7 = 63

4/9 = (4 x 7)/ (9 x 7) = 28/63

2/7 = (2 x 9) / (7 x 9) = 18/63

4/9 + 2/7 = 28/63 + 18/63 = 46/63

(d) 5 / 7 + 1 / 3

Solution:

L.C.M of 7 and 3 = 7 x 3 = 21

5/7 = (5 x 3)/ (7 x 3) = 15/21

1/3 = (1 x 7)/ (3 x7) = 7/21

5 / 7 + 1 / 3 = 15/21 + 7/21 = 22/21

(e) 2 / 5 + 1 / 6

Solution:

L.C.M of 5 and 6 = 5 x 6 = 30

2 / 5 = (2 x 6)/ (5 x 6) = 12/30

1 / 6 = (1 x 5)/ (6 x 5) = 5/30

2 / 5 + 1 / 6 =12/30 + 5/30 =17/30

(f) 4 / 5 + 2 / 3

Solution

L.C.M of 5 and 3 = 5 x 3 = 15

4 / 5 = (4 x 3)/ (5 x 3) = 12/15

2 / 3 = (2 x 5)/ (3 x 5) = 10/15

4 / 5 + 2 / 3 =12/15 + 10/15 =22/15

(g) 3 / 4 – 1 / 3

Solution:

L.C.M of 4 and 3 = 4 x 3 = 12

3 / 4 = (3 x 3)/ (4 x 3) = 9/12

1 / 3 = (1 x 4)/ (3 x 4) = 4/12

3 / 4 - 1 / 3 =9/12 - 4/12 = 5/12

 (h) 5 / 6 – 1 / 3

Solution:

L.C.M of 6 and 3 = 3 x 2 = 6

5 / 6 = (5 x 1)/ (6 x 1) = 5/6

1 / 3 = (1 x 2)/ (3 x 2) = 2/6

5 / 6 - 1 / 3 =5/6 - 2/6 = 3/6 = ½

(i) 2 / 3 + 3 / 4 + 1 / 2

Solution:

L.C.M OF 3, 4 and 2 = 2 x 3 x 2 = 12

2/3 = (2 x 4)/ (3 x 4) = 8/12

¾ = (3 x 3)/ (4 x 3) = 9/12

½= (1 x 6)/ (2 x 6) = 6/12

2 / 3 + 3 / 4 + 1 / 2 = 8/12 + 9/12 +6/12 = 23/12

(j) 1/ 2 + 1 / 3 + 1 / 6

Solution:

L.C.M of 2, 3 and 6 =2 x 3 =6

1 /2 = (1 x 3)/2 x 3) = 3/6

1/3 = (1 x 2)/ (3 x 2) = 2/6

1/6 = (1 x 1)/ (6 x 1) = 1/6

1/ 2 + 1 / 3 + 1 / 6 = 3/6 + 2/6 + 1/6 = 6/6 = 1

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

Solution:

4/3 + 11/3

L.C.M of 3 and 3 = 3

4/3 + 11/3 = 15/3 = 5

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

Solution:

14/3 + 13/4

L.C.M of 3 and 4 = 12

14/3 = (14 x 4)/ (3 x 4) = 56/12

13/4 = (13 x 3)/ (4 x 3) = 39/12

14/3 + 13/4 = 56/12 + 39/12 = 95/12

(m) 16 / 5 – 7 / 5

Solution:

(16 – 7) /5

=9/5

(n) 4 / 3 – 1 / 2

Solution:

L.C.M of 3 and 2 = 6

4/3 = (4 x 2)/ (3 x 2) = 8/6

1 / 2= (1 x3)/ (2 x 3) = 3/6

4/3 – 1 / 2 = 8/6 – 3/6 = 5/6

2. Sarita bought 2 / 5 metre of ribbon and Lalita 3 /4 metre of ribbon. What is the total length of the ribbon they bought?

Solutions:

Ribbon bought by Sarita = 2 / 5 m

Ribbon bought by Lalita = 3 / 4 m

Total length of ribbon bought = 2 / 5 + 3 / 4

L.C. M of 5 and 4 = 20

2/5 = (2 x 4)/ (5 x 4) = 8 / 20

3 / 4 = (3 x 5) / (4 x 5) = 15 / 20

We have,
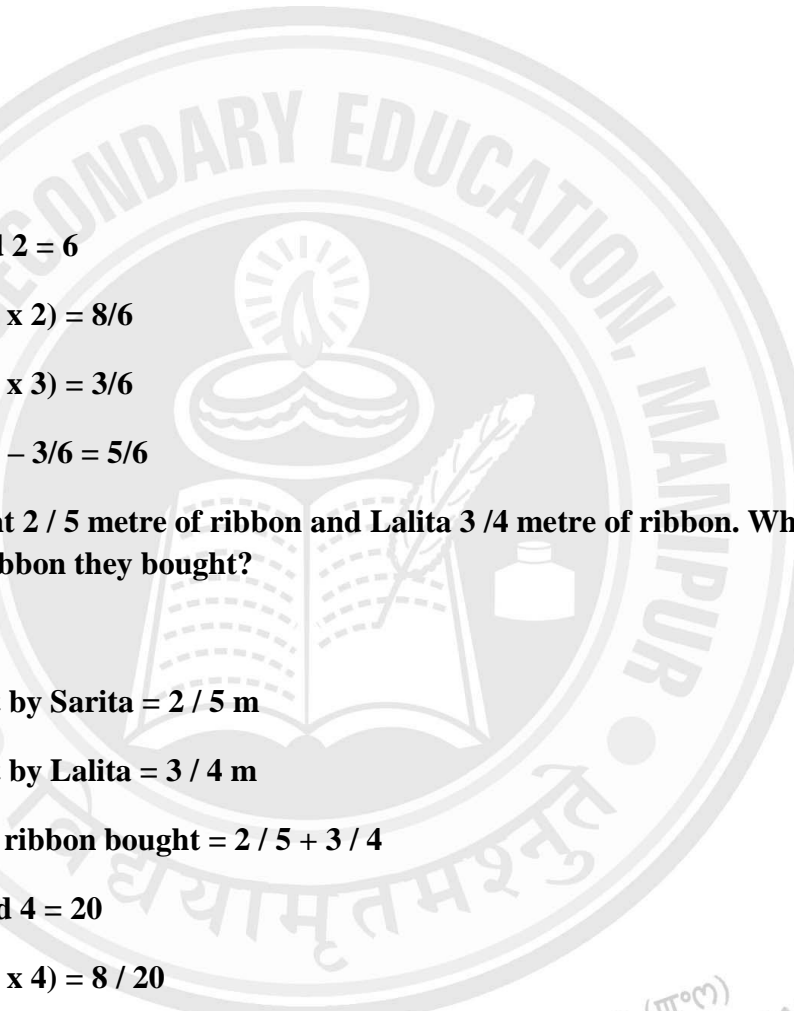
2 / 5 + 3 / 4

= 8 / 20 + 15 / 20

= 23/20

Therefore, the total length of ribbon bought by them is 23/20 m.

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.**

Solutions:

Given piece of cake to Naina $= 1\frac{1}{2} = \frac{3}{2}$

Given piece of cake to Najma $= 1\frac{1}{3} = \frac{4}{3}$

Total amount of cake given to both = 3 / 2 + 4 / 3

$$3 / 2 = (3 \times 3) / (2 \times 3) = 9 / 6$$

$$4 / 3 = (4 \times 2) / (3 \times 2) = 8 / 6$$

We have,

$$3 / 2 + 4 / 3 = 9 / 6 + 8 / 6 = 17 / 6$$

Therefore, the total amount of cake given to both of them is 17 / 6.

4. Fill in the boxes:

(a)□ − 5 / 8 = 1 / 4

(b)□ − 1 / 5 = 1 / 2

(c)1 / 2 − □ = 1 / 6

Solutions:

(a)□ − 5 / 8 = 1 / 4

□ = 1 / 4 + 5 / 8

□ = [(1 × 2 + 5 x 1)] / 8

□ = (2 + 5)/ 8

□ = 7 / 8

(b)□ − 1 / 5 = 1 / 2

□ = 1 / 2 + 1 / 5

□ = (1 x 5 + 1 x 2) / 10

□ = (5 + 2)/ 10

□ = 7 / 10

(c) $1/2 - \square = 1/6$

$\square = 1/2 - 1/6$

$\square = [(1 \times 3) - (1 \times 1)]/6$

$\square = (3 - 1)/6$

$\square = 2/6 = 1/3$

5. Complete the addition and subtraction box.

Solutions:

i) $2/3 + 4/3$

$= (2 + 4)/3$

$= 6/3$

$= 2$

ii) $1/3 + 2/3$

$= (1 + 2)/3$

$= 3/3$

$= 1$

iii) $2/3 - 1/3$

$= (2 - 1)/3$

= 1 / 3

iv) 4 / 3 − 2 / 3

= (4 − 2) / 3

= 2 / 3

v) 1 / 3 + 2 / 3

= (1 + 2) / 3

= 3 / 3

= 1

i) 1 / 2 + 1 / 3

= [(1 × 3) + (1 × 2)] / 6

= (3 + 2) / 6

= 5 / 6

ii) 1 / 3 + 1 / 4

= [(1 × 4) + (1 × 3)] / 12

= (4 + 3) / 12

= 7 / 12

iii) 1 / 2 − 1 / 3

= [(1 × 3) − (1 × 2)] / 6

= (3 − 2) / 6

= 1 / 6

iv) 1 / 3 − 1 / 4

$= [(1 \times 4) - (1 \times 3)] / 12$

$= (4 - 3) / 12$

$= 1 / 12$

v) $1 / 6 + 1 / 12$

$= [(1 \times 2) + 1] / 12$

$= (2 + 1) / 12$

$= 3 / 12$

$= 1 / 4$

6. A piece of wire 7 / 8 metre long broke into two pieces. One piece was 1 / 4 metre long. How long is the other piece?

Solutions:

Total length of wire = 7 / 8 metre

Length of one piece of wire = 1 / 4 metre

∴ length of other piece of wire = 7 / 8 – 1 / 4 metre

$= [(7 \times 1) - (1 \times 2)] / 8$

$= (7 - 2)/ 8$

$= 5 / 8$ metre

7. Nandini's house is 9 / 10 km from her school. She walked some distance and then took a bus for 1 / 2 km to reach the school. How far did she walk?

Solutions:

Total distance = 9 / 10 Km

Distance she travelled by bus = 1 / 2 km

Distance walked by Nandini = $\frac{9}{10} - \frac{1}{2}$ km

$= \frac{9 x 1 - 1 x 5}{10}$ km

$$= \frac{9-5}{10} \text{km}$$

$$= \frac{4}{10} \text{km}$$

$$= \frac{2}{5} \text{km}$$

8. Asha and Samuel have bookshelves of the same size partly filled with books. Asha's shelf is 5 / 6 th full and Samuel's shelf is 2/ 5 th full. Whose bookshelf is more full? By what fraction?

Solutions:

Asha's shelf full of books = 5 / 6

Samuel's shelf full of books = 2 / 5

By cross multiplication we have,

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

5 x 5 ☐ 2 x 6

25 > 12

Hence 5 / 6 > 2 / 5. Asha's bookshelves is more full.

Fractions by which Asha's bookshelves is more full

= 5 / 6 – 2 / 5

= 25 /30 – 12 / 30 [L.C.M of 6 and 5 = 30]

= (25 – 12) / 30

= 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?**

Solutions:

Time taken by Jaidev to walk across the school ground $= 2\frac{1}{5} = \frac{11}{5}$ **minutes**

Time taken by Rahul to do the same $= \frac{7}{4}$ **minutes**

By cross multiplication

$$\frac{11}{5} \boxtimes \frac{7}{4}$$

11 x 4 = 44 > 5 x 7 = 35

11 / 5 > 7 / 4

Fraction by which time is less = 11 / 5 – 7 / 4

= [(11 x 4) – (7 x 5)] / 20

= (44 – 35) / 20

= 9 / 20 minutes.