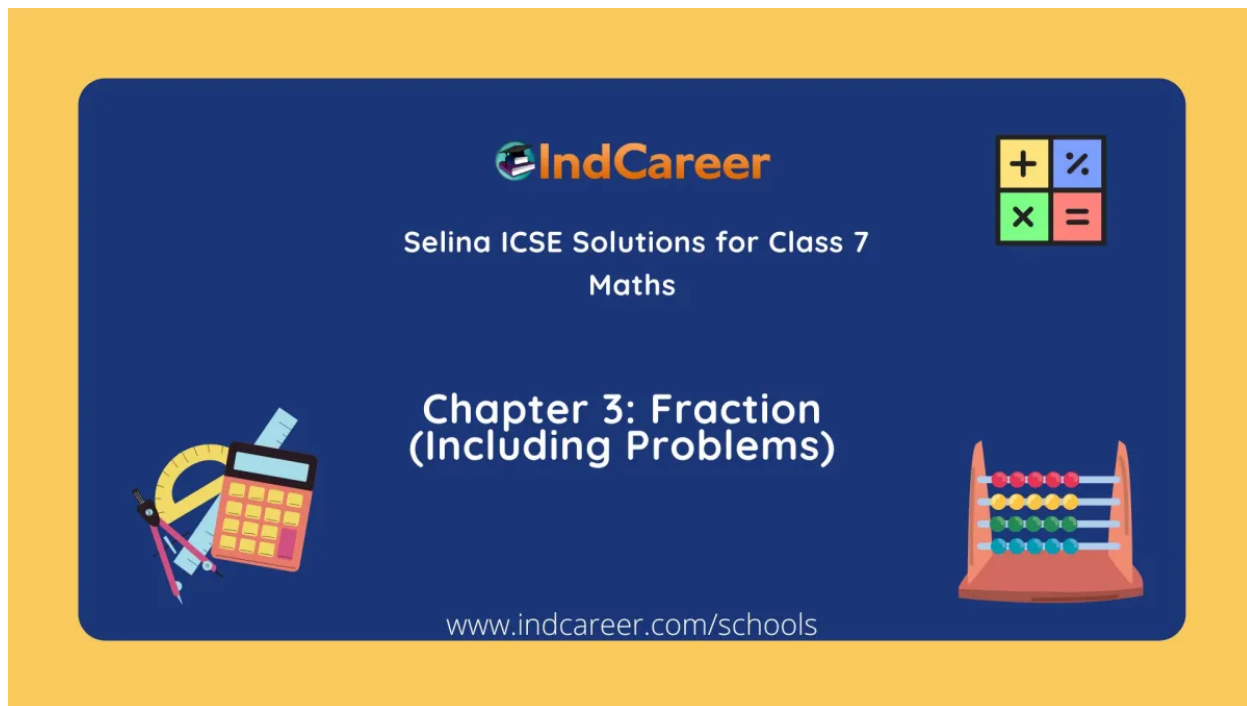


Selina Class 7 ICSE Solutions Mathematics : Chapter 3- Fraction (Including Problems)



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Selina Class 7 ICSE Solutions Mathematics :

Chapter 3- Fraction (Including Problems)

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Selina Class 7 ICSE Solutions Mathematics : Chapter 3- Fraction (Including Problems)

Selina 7th Maths Chapter 3, Class 7 Maths Chapter 3 solutions

Exercise 3A page: 39

1. Classify each fraction given below as decimal or vulgar fraction, proper or improper fraction and mixed fraction:

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

(ii) $\frac{11}{10}$

(iii) $\frac{13}{20}$

(iv) $\frac{18}{7}$

(v) $3\frac{2}{9}$

Solution:

(i) $\frac{3}{5}$ is a vulgar and proper fraction.

(ii) $\frac{11}{10}$ is a decimal and improper fraction.

(iii) $\frac{13}{20}$ is a decimal and proper fraction.

(iv) $\frac{18}{7}$ is a vulgar and improper fraction.

(v) $3\frac{2}{9}$ is a mixed fraction.

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2. Express the following improper fractions as mixed fractions:

(i) $18/5$

(ii) $7/4$

(iii) $25/6$

(iv) $38/5$

(v) $22/5$

Solution:

(i) $18/5$ can be expressed as mixed fractions as $3 \frac{3}{5}$.

(ii) $7/4$ can be expressed as mixed fractions as $1 \frac{3}{4}$.

(iii) $25/6$ can be expressed as mixed fractions as $4 \frac{1}{6}$.

(iv) $38/5$ can be expressed as mixed fractions as $7 \frac{3}{5}$.

(v) $22/5$ can be expressed as mixed fractions as $4 \frac{2}{5}$.

3. Express the following mixed fractions as improper fractions:

(i) $2 \frac{4}{9}$

(ii) $7 \frac{5}{13}$

(iii) $3 \frac{1}{4}$

(iv) $2 \frac{5}{48}$

(v) $12 \frac{7}{11}$

Solution:

(i) $2 \frac{4}{9}$

It can be written as

$$= (2 \times 9 + 4) / 9$$

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By further calculation

$$= (18 + 4)/ 9$$

$$= 22/9$$

(ii) $7 \frac{5}{13}$

It can be written as

$$= (7 \times 13 + 5)/ 13$$

By further calculation

$$= (91 + 5)/ 13$$

$$= 96/13$$

(iii) $3 \frac{1}{4}$

It can be written as

$$= (3 \times 4 + 1)/ 4$$

By further calculation

$$= (12 + 1)/ 4$$

$$= 13/4$$

(iv) $2 \frac{5}{48}$

It can be written as

$$= (2 \times 48 + 5)/ 48$$

By further calculation

$$= (96 + 5)/ 48$$

$$= 101/48$$

(v) $12 \frac{7}{11}$

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It can be written as

$$= (12 \times 11 + 7) / 11$$

By further calculation

$$= (132 + 7) / 11$$

$$= 139/11$$

4. Reduce the given fractions to lowest terms:

(i) $8/18$

(ii) $27/36$

(iii) $18/42$

(iv) $35/75$

(v) $18/45$

Solution:

(i) $8/18$

Here the HCF of 8 and 18 is 2

So by dividing numerator and denominator by 2

$$= (8 \div 2) / (18 \div 2)$$

We get

$$= 4/9$$

(ii) $27/36$

Here the HCF of 27 and 36 is 9

So by dividing numerator and denominator by 9

$$= (27 \div 9) / (36 \div 9)$$

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We get

$$= 3/4$$

(iii) 18/42

Here the HCF of 18 and 42 is 6

So by dividing both numerator and denominator by 6

$$= (18 \div 6) / (42 \div 6)$$

We get

$$= 3/7$$

(iv) 35/75

Here the HCF of 35 and 75 is 5

So by dividing both numerator and denominator by 5

$$= (35 \div 5) / (75 \div 5)$$

We get

$$= 7/15$$

(v) 18/45

Here the HCF of 18 and 45 is 9

So by dividing both numerator and denominator by 9

$$= (18 \div 9) / (45 \div 9)$$

We get

$$= 2/5$$

5. State true or false:

(i) 30/40 and 12/16 are equivalent fractions.

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(ii) $10/25$ and $25/10$ are equivalent fractions.

(iii) $35/49$, $20/28$, $45/63$ and $100/140$ are equivalent fractions.

Solution:

(i) True.

Here $30/40 = 3/4$ and $12/16 = 3/4$

(ii) False.

Here $10/25 = 2/5$ and $25/10 = 5/2$

(iii) True.

$35/49 = 5/7$, $20/28 = 5/7$, $45/63 = 5/7$ and $100/140 = 5/7$ where all are equal.

6. Distinguish each of the fractions, given below, as a simple fraction or a complex fraction:

(i) $0/8$

(ii) $-3/-8$

(iii) $5/-7$

(iv) $3\frac{3}{5}/18$

(v) $-6/2\frac{2}{5}$

(vi) $3\frac{1}{3}/7\frac{2}{7}$

(vii) $-5\frac{2}{9}/5$

(viii) $-8/0$

Solution:

(i) $0/8$ is a simple fraction.

(ii) $-3/-8$ is a simple fraction.

(iii) $5/-7$ is a simple fraction.

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- (iv) $3\frac{3}{5}/18$ is a complex fraction.
- (v) $-6/2\frac{2}{5}$ is a complex fraction.
- (vi) $3\frac{1}{3}/7\frac{2}{7}$ is a complex fraction.
- (vii) $-5\frac{2}{9}/5$ is a complex fraction.
- (viii) $-8/0$ is neither a complex nor a simple fraction.

Exercise 3B page: 43

1. For each pair, given below, state whether it forms like fractions or unlike fractions:

(i) $5/8$ and $7/8$

(ii) $8/15$ and $8/21$

(iii) $4/9$ and $9/4$

Solution:

- (i) $5/8$ and $7/8$ are like fractions.
- (ii) $8/15$ and $8/21$ are unlike fractions.
- (iii) $4/9$ and $9/4$ are unlike fractions.

2. Convert given fractions into fractions with equal denominators:

(i) $5/6$ and $7/9$

(ii) $2/3$, $5/6$ and $7/12$

(iii) $4/5$, $17/20$, $23/20$ and $11/16$

Solution:

(i) $5/6$ and $7/9$

Here the LCM of 6 and 9 is 18

$$5/6 = (5 \times 3)/(6 \times 3) = 15/18$$

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$$7/9 = (7 \times 2) / (9 \times 2) = 14/18$$

Therefore, 15/18 and 14/18 are the required fractions.

(ii) 2/3, 5/6 and 7/12

Here the LCM of 3, 6 and 12 is 12

$$2/3 = (2 \times 4) / (3 \times 4) = 8/12$$

$$5/6 = (5 \times 2) / (6 \times 2) = 10/12$$

$$7/12 = 7/12$$

Therefore, 8/12, 10/12 and 7/12 are the required fractions.

(iii) 4/5, 17/20, 23/40 and 11/16

Here the LCM of 5, 20, 40 and 16 is 80

$$4/5 = (4 \times 16) / (5 \times 16) = 64/80$$

$$17/20 = (17 \times 4) / (20 \times 4) = 68/80$$

$$23/40 = (23 \times 2) / (40 \times 2) = 46/80$$

$$11/16 = (11 \times 5) / (16 \times 5) = 55/80$$

Therefore, 64/80, 68/80, 46/80 and 55/80 are the required fractions.

3. Convert given fractions into fractions with equal numerators:

(i) 8/9 and 12/17

(ii) 6/13, 15/23 and 12/17

(iii) 15/19, 25/28, 9/11 and 45/47

Solution:

(i) 8/9 and 12/17

Here the LCM of 8 and 12 is 24

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$$8/9 = (8 \times 3) / (9 \times 3) = 24/27$$

$$12/17 = (12 \times 2) / (17 \times 2) = 24/34$$

Therefore, 24/27 and 24/34 are the required fractions.

(ii) 6/13, 15/23 and 12/17

Here the LCM of 6, 15 and 12 is 60

$$6/13 = (6 \times 10) / (13 \times 10) = 60/130$$

$$15/23 = (15 \times 4) / (23 \times 4) = 60/92$$

$$12/17 = (12 \times 5) / (17 \times 5) = 60/85$$

Therefore, 60/130, 60/92 and 60/85 are the required fractions.

(iii) 15/19, 25/28, 9/11 and 45/47

Here the LCM of 15, 25, 9 and 45 is 225

$$15/19 = (15 \times 15) / (19 \times 15) = 225/285$$

$$25/28 = (25 \times 9) / (28 \times 9) = 225/252$$

$$9/11 = (9 \times 25) / (11 \times 25) = 225/275$$

$$45/47 = (45 \times 5) / (47 \times 5) = 225/235$$

Therefore, 225/285, 225/252, 225/275 and 225/235 are the required fractions.

4. Put the given fractions in ascending order by making denominators equal:

(i) 1/3, 2/5, 3/4 and 1/6

(ii) 5/6, 7/8, 11/12 and 3/10

(iii) 5/7, 3/8, 9/14 and 20/21

Solution:

(i) 1/3, 2/5, 3/4 and 1/6

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Here the LCM of 3, 5, 4 and 6 is 60

$$1/3 = (1 \times 20) / (3 \times 20) = 20/60$$

$$2/5 = (2 \times 12) / (5 \times 12) = 24/60$$

$$3/4 = (3 \times 15) / (4 \times 15) = 45/60$$

$$1/6 = (1 \times 10) / (6 \times 10) = 10/60$$

So we get

$$10/60 < 20/60 < 24/60 < 45/60$$

It can be written as

$$1/6 < 1/3 < 2/5 < 3/4$$

Therefore, $1/6$, $1/3$, $2/5$ and $3/4$ are in ascending order.

(ii) $5/6$, $7/8$, $11/12$ and $3/10$

Here the LCM of 6, 8, 12 and 10 is 240

$$5/6 = (5 \times 40) / (6 \times 40) = 200/240$$

$$7/8 = (7 \times 30) / (8 \times 30) = 210/240$$

$$11/12 = (11 \times 20) / (12 \times 20) = 220/240$$

$$3/10 = (3 \times 24) / (10 \times 24) = 72/240$$

So we get

$$72/240 < 200/240 < 210/240 < 220/240$$

It can be written as

$$3/10 < 5/6 < 7/8 < 11/12$$

Therefore, $3/10$, $5/6$, $7/8$ and $11/12$ are in ascending order.

(iii) $5/7$, $3/8$, $9/14$ and $20/21$

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Here the LCM of 7, 8, 14 and 21 is 168

$$5/7 = (5 \times 24) / (7 \times 24) = 120/168$$

$$3/8 = (3 \times 21) / (8 \times 21) = 63/168$$

$$9/14 = (9 \times 12) / (14 \times 12) = 108/168$$

$$20/21 = (20 \times 8) / (21 \times 8) = 160/168$$

So we get

$$63/168 < 108/168 < 120/168 < 160/168$$

It can be written as

$$3/8 < 9/14 < 5/7 < 20/21$$

Therefore, 3/8, 9/14, 5/7 and 20/21 are in ascending order.

5. Arrange the given fractions in descending order by making numerators equal:

(i) 5/6, 4/15, 8/9 and 1/3

(ii) 3/7, 4/9, 5/7 and 8/11

(iii) 1/10, 6/11, 8/11 and 3/5

Solution:

(i) 5/6, 4/15, 8/9 and 1/3

Here the LCM of 6, 15, 9 and 3 is 45

$$5/6 = (5 \times 8) / (6 \times 8) = 40/48$$

$$4/15 = (4 \times 10) / (15 \times 10) = 40/150$$

$$8/9 = (8 \times 5) / (9 \times 5) = 40/45$$

$$1/3 = (1 \times 40) / (3 \times 40) = 40/120$$

So we get

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$$40/45 > 40/48 > 40/120 > 40/150$$

It can be written as

$$8/9 > 5/6 > 1/3 > 4/15$$

Therefore, $8/9$, $5/6$, $1/3$ and $4/15$ are in descending order.

(ii) $3/7$, $4/9$, $5/7$ and $8/11$

Here the LCM of 3, 4, 5 and 8 is 120

$$3/7 = (3 \times 40) / (7 \times 40) = 120/280$$

$$4/9 = (4 \times 30) / (9 \times 30) = 120/270$$

$$5/7 = (5 \times 24) / (7 \times 24) = 120/168$$

$$8/11 = (8 \times 15) / (11 \times 15) = 120/165$$

So we get

$$120/165 > 120/168 > 120/270 > 120/280$$

It can be written as

$$8/11 > 5/7 > 4/9 > 3/7$$

Therefore, $8/11$, $5/7$, $4/9$ and $3/7$ are in descending order.

(iii) $1/10$, $6/11$, $8/11$ and $3/5$

Here the LCM of 1, 6, 8 and 3 is 24

$$1/10 = (1 \times 24) / (10 \times 24) = 24/240$$

$$6/11 = (6 \times 4) / (11 \times 4) = 24/44$$

$$8/11 = (8 \times 3) / (11 \times 3) = 24/33$$

$$3/5 = (3 \times 8) / (5 \times 8) = 24/40$$

So we get

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$$24/33 > 24/40 > 24/44 > 24/240$$

It can be written as

$$8/11 > 3/5 > 6/11 > 1/10$$

Therefore, $8/11$, $3/5$, $6/11$ and $1/10$ are in descending order.

6. Find the greater fraction:

(i) $3/5$ and $11/15$

(ii) $4/5$ and $3/10$

(iii) $6/7$ and $5/9$

Solution:

(i) $3/5$ and $11/15$

Here the LCM of 5 and 15 is 15

$$3/5 = (3 \times 3) / (5 \times 3) = 9/15$$

$$11/15 = 11/15$$

So we get, $11/15 > 9/15$

Therefore, $11/15$ is greater.

(ii) $4/5$ and $3/10$

Here the LCM of 5 and 10 is 10

$$4/5 = (4 \times 2) / (5 \times 2) = 8/10$$

$$3/10 = 3/10$$

So we get, $8/10 > 3/10$

$$4/5 > 3/10$$

Therefore, $4/5$ is greater.

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(iii) $\frac{6}{7}$ and $\frac{5}{9}$

Here LCM of 7 and 9 is 63

$$\frac{6}{7} = \frac{(6 \times 9)}{(7 \times 9)} = \frac{54}{63}$$

$$\frac{5}{9} = \frac{(5 \times 7)}{(9 \times 7)} = \frac{35}{63}$$

So we get, $\frac{54}{63} > \frac{35}{63}$

$$\frac{6}{7} > \frac{35}{63}$$

Therefore, $\frac{6}{7}$ is greater.

7. Insert one fraction between:

(i) $\frac{3}{7}$ and $\frac{4}{9}$

(ii) 2 and $\frac{8}{3}$

(iii) $\frac{9}{17}$ and $\frac{6}{13}$

Solution:

(i) $\frac{3}{7}$ and $\frac{4}{9}$

So the fraction between $\frac{3}{7}$ and $\frac{4}{9}$

$$= \frac{(3 + 4)}{(7 + 9)}$$

$$= \frac{7}{16}$$

(ii) 2 and $\frac{8}{3}$

So the fraction between 2 and $\frac{8}{3}$

$$= \frac{(2 + 8)}{(1 + 3)}$$

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

Dividing by 2

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

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

(iii) $\frac{9}{17}$ and $\frac{6}{13}$

So the fraction between $\frac{9}{17}$ and $\frac{6}{13}$

$$= (9 + 6) / (17 + 13)$$

$$= 15/30$$

By division

$$= 1/2$$

8. Insert three fractions between:

(i) $\frac{2}{5}$ and $\frac{4}{9}$

(ii) $\frac{1}{2}$ and $\frac{5}{7}$

(iii) $\frac{3}{8}$ and $\frac{6}{11}$

Solution:

(i) $\frac{2}{5}$ and $\frac{4}{9}$

So the fraction between $\frac{2}{5}$ and $\frac{4}{9}$

$$= (2 + 4) / (5 + 9)$$

By addition

$$= 6/14$$

Dividing by 2

$$= 3/7$$

Fraction between $\frac{2}{5}$ and $\frac{3}{7}$

$$= (2 + 3) / (5 + 7)$$

$$= 5/12$$

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Fraction between $\frac{3}{7}$ and $\frac{4}{9}$

$$= (3 + 4) / (7 + 9)$$

$$= 7/16$$

Therefore, three fractions between $\frac{2}{5}$ and $\frac{4}{9}$ will be $\frac{5}{12}$, $\frac{3}{7}$ and $\frac{7}{16}$.

(ii) $\frac{1}{2}$ and $\frac{5}{7}$

So the fraction between $\frac{1}{2}$ and $\frac{5}{7}$

$$= (1 + 5) / (2 + 7)$$

By addition

$$= 6/9$$

Dividing by 3

$$= 2/3$$

Fraction between $\frac{1}{2}$ and $\frac{2}{3}$

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

$$= 3/5$$

Fraction between $\frac{2}{3}$ and $\frac{5}{7}$

$$= (2 + 5) / (3 + 7)$$

$$= 7/10$$

Therefore, three fractions between $\frac{1}{2}$ and $\frac{5}{7}$ will be $\frac{3}{5}$, $\frac{2}{3}$ and $\frac{7}{10}$.

(iii) $\frac{3}{8}$ and $\frac{6}{11}$

So the fraction between $\frac{3}{8}$ and $\frac{6}{11}$

$$= (3 + 6) / (8 + 11)$$

$$= 9/19$$

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Fraction between $\frac{3}{8}$ and $\frac{9}{19}$

$$= (3 + 9) / (8 + 19)$$

$$= 12/27$$

$$= 4/9$$

Fraction between $\frac{9}{19}$ and $\frac{6}{11}$

$$= (9 + 6) / (19 + 11)$$

$$= 15/30$$

$$= 1/2$$

Therefore, three fractions between $\frac{3}{8}$ and $\frac{6}{11}$ will be $\frac{4}{9}$, $\frac{9}{19}$ and $\frac{1}{2}$.

9. Insert two fractions between:

(i) 1 and $\frac{3}{11}$

(ii) $\frac{5}{9}$ and $\frac{1}{4}$

(iii) $\frac{5}{6}$ and $1\frac{1}{5}$

Solution:

(i) 1 and $\frac{3}{11}$

Fraction between 1 and $\frac{3}{11}$

$$= (1 + 3) / (1 + 11)$$

By addition

$$= 4/12$$

$$= 1/3$$

Fraction between $\frac{1}{3}$ and $\frac{3}{11}$

$$= (1 + 3) / (3 + 11)$$

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By addition

$$= 4/14$$

Dividing by 2

$$= 2/7$$

Therefore, two fractions between 1 and $3/11$ will be $1/3$ and $2/7$.

(ii) $5/9$ and $1/4$

Fraction between $5/9$ and $1/4$

$$= (5 + 1) / (9 + 4)$$

By addition

$$= 6/13$$

Fraction between $6/13$ and $1/4$

$$= (6 + 1) / (13 + 4)$$

By addition

$$= 7/17$$

Therefore, two fractions between $5/9$ and $1/4$ will be $6/13$ and $7/17$.

(iii) $5/6$ and $1 \frac{1}{5}$

It can be written as

$$= 5/6 + 6/5$$

Fraction between $5/6$ and $6/5$

$$= (5 + 6) / (6 + 5)$$

By addition

$$= 11/11$$

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$$= 1$$

Fraction between 1 and $\frac{6}{5}$

$$= (1 + 6) / (1 + 5)$$

By addition

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

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

Therefore, two fractions between $\frac{5}{6}$ and $1 \frac{1}{5}$ will be 1 and $1 \frac{1}{6}$.

Exercise 3C page: 46

1. Reduce to a single fraction:

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

(ii) $\frac{3}{5} - \frac{1}{10}$

(iii) $\frac{2}{3} - \frac{1}{6}$

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

(v) $\frac{1}{4} + \frac{5}{6} - \frac{1}{12}$

(vi) $\frac{2}{3} - \frac{3}{5} + 3 - \frac{1}{5}$

(vii) $\frac{2}{3} - \frac{1}{5} + \frac{1}{10}$

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

(ix) $2 \frac{5}{8} - 2 \frac{1}{6} + 4 \frac{3}{4}$

Solution:

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

Here the LCM of 2 and 3 is 6

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

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By further calculation

$$= 3/6 + 4/6$$

$$= (3 + 4)/6$$

So we get

$$= 7/6$$

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

$$(ii) \frac{3}{5} - \frac{1}{10}$$

Here the LCM of 5 and 10 is 10

$$= (3 \times 2)/(5 \times 2) - 1/10$$

By further calculation

$$= 6/10 - 1/10$$

So we get

$$= (6 - 1)/10$$

$$= 5/10$$

$$= 1/2$$

$$(iii) \frac{2}{3} - \frac{1}{6}$$

Here the LCM of 3 and 6 is 6

$$= (2 \times 2)/(3 \times 2) - 1/6$$

By further calculation

$$= 4/6 - 1/6$$

So we get

$$= (4 - 1)/6$$

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$$= 3/6$$

$$= 1/2$$

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

It can be written as

$$= 4/3 + 9/4$$

Here LCM of 3 and 4 is 12

$$= (4 \times 4)/ (3 \times 4) + (9 \times 3)/ (4 \times 3)$$

By further calculation

$$= 16/12 + 27/12$$

So we get

$$= (16 + 27)/ 12$$

$$= 43/12$$

$$= 3 \frac{7}{12}$$

$$(v) 1/4 + 5/6 - 1/12$$

Here LCM of 4, 6 and 12 is 12

$$= (1 \times 3)/ (4 \times 3) + (5 \times 2)/ (6 \times 2) - 1/12$$

By further calculation

$$= 3/12 + 10/12 - 1/12$$

So we get

$$= (3 + 10 - 1)/ 12$$

$$= 12/12$$

$$= 1$$

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(vi) $\frac{2}{3} - \frac{3}{5} + 3 - \frac{1}{5}$

Here LCM of 3 and 5 is 15

$$= \frac{(2 \times 5)}{(3 \times 5)} - \frac{(3 \times 3)}{(5 \times 3)} + \frac{(3 \times 15)}{15} - \frac{(1 \times 3)}{(5 \times 3)}$$

By further calculation

$$= \frac{10}{15} - \frac{9}{15} + \frac{45}{15} - \frac{3}{15}$$

So we get

$$= \frac{(10 - 9 + 45 - 3)}{15}$$

$$= \frac{(55 - 12)}{15}$$

$$= \frac{43}{15}$$

$$= 2 \frac{13}{15}$$

(vii) $\frac{2}{3} - \frac{1}{5} + \frac{1}{10}$

Here the LCM of 3, 5 and 10 is 30

$$= \frac{(2 \times 10)}{(3 \times 10)} - \frac{(1 \times 6)}{(5 \times 6)} + \frac{(1 \times 3)}{(10 \times 3)}$$

By further calculation

$$= \frac{20}{30} - \frac{6}{30} + \frac{3}{30}$$

So we get

$$= \frac{(20 - 6 + 3)}{30}$$

$$= \frac{(23 - 6)}{30}$$

$$= \frac{17}{30}$$

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

It can be written as

$$= \frac{5}{2} + \frac{7}{3} - \frac{5}{4}$$

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Here the LCM of 2, 3 and 4 is 12

$$= (5 \times 6) / (2 \times 6) + (7 \times 4) / (3 \times 4) - (5 \times 3) / (4 \times 3)$$

By further calculation

$$= 30/12 + 28/12 - 15/12$$

So we get

$$= (30 + 28 - 15) / 12$$

$$= (58 - 15) / 12$$

$$= 43/12$$

$$= 3 \frac{7}{12}$$

$$(ix) 2 \frac{5}{8} - 2 \frac{1}{6} + 4 \frac{3}{4}$$

It can be written as

$$= 21/8 - 13/6 + 19/4$$

Here the LCM of 8, 6 and 4 is 24

$$= (21 \times 3) / (8 \times 3) - (13 \times 4) / (6 \times 4) + (19 \times 6) / (4 \times 6)$$

By further calculation

$$= 63/24 - 52/24 + 114/24$$

So we get

$$= (63 - 52 + 114) / 24$$

$$= (177 - 52) / 24$$

$$= 125/24$$

$$= 5 \frac{5}{24}$$

2. Simplify:

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(i) $\frac{3}{4} \times 6$

(ii) $\frac{2}{3} \times 15$

(iii) $\frac{3}{4} \times \frac{1}{2}$

(iv) $\frac{9}{12} \times \frac{4}{7}$

(v) $45 \times 2\frac{1}{3}$

(vi) $36 \times 3\frac{1}{4}$

(vii) $2 \div \frac{1}{3}$

(viii) $3 \div \frac{2}{5}$

(ix) $1 \div \frac{3}{5}$

(x) $\frac{1}{3} \div \frac{1}{4}$

(xi) $-\frac{5}{8} \div \frac{3}{4}$

(xii) $3\frac{3}{7} \div 1\frac{1}{14}$

(xiii) $3\frac{3}{4} \times 1\frac{1}{5} \times \frac{20}{21}$

Solution:

(i) $\frac{3}{4} \times 6$

It can be written as

$$= \frac{3}{4} \times \frac{6}{1}$$

$$= \frac{(3 \times 6)}{(4 \times 1)}$$

So we get

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

HCF of 18 and 4 is 2

Dividing both numerator and denominator by 2

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$$= (18 \div 2) / (4 \div 2)$$

$$= 9/2$$

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

(ii) $\frac{2}{3} \times 15$

It can be written as

$$= \frac{2}{3} \times \frac{15}{1}$$

$$= (2 \times 15) / (3 \times 1)$$

So we get

$$= 30/3$$

$$= 10$$

(iii) $\frac{3}{4} \times \frac{1}{2}$

It can be written as

$$= (3 \times 1) / (4 \times 2)$$

$$= 3/8$$

(iv) $\frac{9}{12} \times \frac{4}{7}$

It can be written as

$$= (9 \times 4) / (12 \times 7)$$

So we get

$$= 36/84$$

Here the HCF of 36 and 84 is 12

Dividing both numerator and denominator by 12

$$= (36 \div 12) / (84 \div 12)$$

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$$= 3/7$$

$$(v) 45 \times 2 \frac{1}{3}$$

It can be written as

$$= 45/1 \times 7/3$$

$$= (45 \times 7) / (1 \times 3)$$

So we get

$$= 315/3$$

$$= 105$$

$$(vi) 36 \times 3 \frac{1}{4}$$

It can be written as

$$= 36/1 \times 13/4$$

$$= (36 \times 13) / (4 \times 1)$$

So we get

$$= 468/4$$

$$= 117$$

$$(vii) 2 \div 1/3$$

It can be written as

$$= 2/1 \times 3/1$$

$$= (2 \times 3) / (1 \times 1)$$

So we get

$$= 6/1$$

$$= 6$$

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(viii) $3 \div \frac{2}{5}$

It can be written as

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

$$= \frac{(3 \times 5)}{(1 \times 2)}$$

So we get

$$= \frac{15}{2}$$

$$= 7 \frac{1}{2}$$

(ix) $1 \div \frac{3}{5}$

It can be written as

$$= 1 \times \frac{5}{3}$$

$$= \frac{(1 \times 5)}{3}$$

So we get

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

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

(x) $\frac{1}{3} \div \frac{1}{4}$

It can be written as

$$= \frac{1}{3} \times \frac{4}{1}$$

$$= \frac{(1 \times 4)}{(3 \times 1)}$$

So we get

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

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

(xi) $-\frac{5}{8} \div \frac{3}{4}$

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It can be written as

$$= -5/8 \times 4/3$$

$$= (-5 \times 4) / (8 \times 3)$$

So we get

$$= -20/24$$

Here the HCF of 20 and 24 is 4

So by dividing both numerator and denominator by 4

$$= (-20 \div 4) / (24 \div 4)$$

$$= -5/6$$

(xii) $3 \frac{3}{7} \div 1 \frac{1}{14}$

It can be written as

$$= 24/7 \times 14/15$$

$$= (24 \times 14) / (7 \times 15)$$

So we get

$$= 336/105$$

Here the HCF of 336 and 105 is 21

So by dividing both numerator and denominator by 21

$$= (336 \div 21) / (105 \div 21)$$

$$= 16/5$$

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

(xiii) $3 \frac{3}{4} \times 1 \frac{1}{5} \times 20/21$

It can be written as

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$$= 15/4 \times 6/5 \times 20/21$$

$$= (15 \times 6 \times 20) / (4 \times 5 \times 21)$$

So we get

$$= 1800/420$$

Here the HCF of 1800 and 420 is 60

So by dividing both numerator and denominator by 60

$$= (1800 \div 60) / (420 \div 60)$$

$$= 30/7$$

$$= 4 \frac{2}{7}$$

3. Subtract:

(i) 2 from $2/3$

(ii) $1/8$ from $5/8$

(iii) $-2/5$ and $2/5$

(iv) $-3/7$ from $3/7$

(v) 0 from $-4/5$

(vi) $2/9$ from $4/5$

(vii) $-4/7$ from $-6/11$

Solution:

(i) 2 from $2/3$

It can be written as

$$= 2/3 - 2/1$$

LCM of 3 and 1 is 3

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$$= 2/3 - (2 \times 3)/3$$

$$= 2/3 - 6/3$$

So we get

$$= (2 - 6)/3$$

$$= -4/3$$

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

(ii) $1/8$ from $5/8$

It can be written as

$$= 5/8 - 1/8$$

$$= (5 - 1)/8$$

So we get

$$= 4/8$$

$$= 1/2$$

(iii) $-2/5$ and $2/5$

It can be written as

$$= 2/5 - (-2/5)$$

$$= 2/5 + 2/5$$

So we get

$$= (2 + 2)/5$$

$$= 4/5$$

(iv) $-3/7$ from $3/7$

It can be written as

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$$= 3/7 - (-3/7)$$

$$= 3/7 + 3/7$$

So we get

$$= (3 + 3)/7$$

$$= 6/7$$

(v) 0 from $-4/5$

It can be written as

$$= -4/5 - 0$$

$$= -4/5$$

(vi) $2/9$ from $4/5$

It can be written as

$$= 4/5 - 2/9$$

LCM of 5 and 9 is 45

$$= (4 \times 9)/(5 \times 9) - (2 \times 5)/(9 \times 5)$$

By further calculation

$$= 36/45 - 10/45$$

$$= (36 - 10)/45$$

$$= 26/45$$

(vii) $-4/7$ from $-6/11$

It can be written as

$$= -6/11 - (-4/7)$$

$$= -6/11 + 4/7$$

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Here LCM of 7 and 11 is 77

$$= (-6 \times 7) / (11 \times 7) + (4 \times 11) / (7 \times 11)$$

By further calculation

$$= -42/77 + 44/77$$

So we get

$$= (-42 + 44) / 77$$

$$= 2/77$$

4. Find the value of:

(i) $\frac{1}{2}$ and 10 kg

(ii) $\frac{3}{5}$ of 1 hour

(iii) $\frac{4}{7}$ of $2\frac{1}{3}$ kg

(iv) $3\frac{1}{2}$ times of 2 metre

(v) $\frac{1}{2}$ of $2\frac{2}{3}$

(vi) $\frac{5}{11}$ of $\frac{4}{5}$ of 22 kg

Solution:

(i) $\frac{1}{2}$ and 10 kg

It can be written as

$$= (\frac{1}{2} \times 10) \text{ kg}$$

$$= 5 \text{ kg}$$

(ii) $\frac{3}{5}$ of 1 hour

It can be written as

$$= (\frac{3}{5} \times 60) \text{ minutes}$$

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$$= 3 \times 12$$

$$= 36 \text{ minutes}$$

(iii) $\frac{4}{7}$ of $2\frac{1}{3}$ kg

It can be written as

$$= \left(\frac{4}{7} \times \frac{7}{3}\right) \text{ kg}$$

So we get

$$= \frac{4}{3} \text{ kg}$$

$$= 1\frac{1}{3} \text{ kg}$$

(iv) $3\frac{1}{2}$ times of 2 metre

It can be written as

$$= \left(\frac{7}{2} \times 2\right) \text{ metres}$$

$$= 7 \text{ metres}$$

(v) $\frac{1}{2}$ of $2\frac{2}{3}$

It can be written as

$$= \frac{1}{2} \times \frac{8}{3}$$

So we get

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

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

(vi) $\frac{5}{11}$ of $\frac{4}{5}$ of 22 kg

It can be written as

$$= \left(\frac{5}{11} \times \frac{4}{5} \times \frac{22}{1}\right) \text{ kg}$$

So we get

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$$= 4 \times 2$$

$$= 8 \text{ kg}$$

5. Simplify and reduce to a simple fraction:

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

(ii) $\frac{3}{5} \div \frac{7}{7}$

(iii) $\frac{3}{5} \div \frac{7}{7}$

(iv) $2\frac{1}{5} \div 1\frac{1}{10}$

(v) $\frac{2}{5} \text{ of } \frac{6}{11} \times 1\frac{1}{4}$

(vi) $2\frac{1}{4} \div \frac{1}{7} \times \frac{1}{3}$

(vii) $\frac{1}{3} \times 4\frac{2}{3} \div 3\frac{1}{2} \times \frac{1}{2}$

(viii) $\frac{2}{3} \times 1\frac{1}{4} \div \frac{3}{7} \text{ of } 2\frac{5}{8}$

(ix) $0 \div \frac{8}{11}$

(x) $\frac{4}{5} \div \frac{7}{15} \text{ of } \frac{8}{9}$

(xi) $\frac{4}{5} \div \frac{7}{15} \times \frac{8}{9}$

(xii) $\frac{4}{5} \text{ of } \frac{7}{15} \div \frac{8}{9}$

(xiii) $\frac{1}{2} \text{ of } \frac{3}{4} \times \frac{1}{2} \div \frac{2}{3}$

Solution:

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

It can be written as

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

So we get

$$= (3 \times 4) / 15$$

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$$= 4/5$$

(ii) $3/5 \div 7$

It can be written as

$$= 3/5 \times 1/7$$

$$= 3/35$$

(iii) $3 \div 5/7$

It can be written as

$$= 3 \times 7/5$$

So we get

$$= 21/5$$

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

(iv) $2 \frac{1}{5} \div 1 \frac{1}{10}$

It can be written as

$$= 11/5 \div 11/10$$

So we get

$$= 11/5 \times 10/11$$

$$= 2$$

(v) $2/5$ of $6/11 \times 1 \frac{1}{4}$

It can be written as

$$= 2/5 \text{ of } 6/11 \times 5/4$$

So we get

$$= 12/55 \times 5/4$$

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$$= 3/11$$

(vi) $2 \frac{1}{4} \div \frac{1}{7} \times \frac{1}{3}$

It can be written as

$$= \frac{9}{4} \div \frac{1}{7} \times \frac{1}{3}$$

So we get

$$= \frac{9}{4} \times \frac{7}{1} \times \frac{1}{3}$$

$$= 21/4$$

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

(vii) $\frac{1}{3} \times 4 \frac{2}{3} \div 3 \frac{1}{2} \times \frac{1}{2}$

It can be written as

$$= \frac{1}{3} \times \frac{14}{3} \div \frac{7}{2} \times \frac{1}{2}$$

So we get

$$= \frac{1}{3} \times \frac{14}{3} \times \frac{2}{7} \times \frac{1}{2}$$

$$= \frac{2}{9}$$

(viii) $\frac{2}{3} \times 1 \frac{1}{4} \div \frac{3}{7}$ of $2 \frac{5}{8}$

It can be written as

$$= \frac{2}{3} \times \frac{5}{4} \div \frac{3}{7} \text{ of } \frac{21}{8}$$

So we get

$$= \frac{2}{3} \times \frac{5}{4} \div \frac{9}{8}$$

Here

$$= \frac{2}{3} \times \frac{5}{4} \times \frac{8}{9}$$

$$= \frac{20}{27}$$

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(ix) $0 \div 8/11$

It can be written as

$$= 0 \times 11/8$$

$$= 0$$

(x) $4/5 \div 7/15$ of $8/9$

From BODMAS rule

$$= 4/5 \div 156/135$$

So we get

$$= 4/5 \times 135/56$$

$$= 27/14$$

$$= 1 \frac{13}{14}$$

(xi) $4/5 \div 7/15 \times 8/9$

It can be written as

$$= 4/5 \times 15/7 \times 8/9$$

So we get

$$= 32/21$$

$$= 1 \frac{11}{21}$$

(xii) $4/5$ of $7/15 \div 8/9$

From BODMAS rule

$$= 28/75 \div 8/9$$

So we get

$$= 28/75 \times 9/8$$

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By further calculation

$$= (7 \times 3) / (25 \times 2)$$

$$= 21/50$$

(xiii) $1/2$ of $3/4 \times 1/2 \div 2/3$

From BODMAS rule

$$= 3/8 \times 1/2 \div 2/3$$

So we get

$$= 3/8 \times 1/2 \times 3/2$$

$$= 9/32$$

6. A bought $3 \frac{3}{4}$ kg of wheat and $2 \frac{1}{2}$ kg of rice. Find the total weight wheat and rice bought.

Solution:

It is given that

$$\text{Weight of wheat} = 3 \frac{3}{4} \text{ kg} = 15/4 \text{ kg}$$

$$\text{Weight of rice} = 2 \frac{1}{2} \text{ kg} = 5/2 \text{ kg}$$

$$\text{So the total weight of wheat and rice} = 15/4 + 5/2$$

Here the LCM of 4 and 2 is 4

$$= (15 \times 1) / (4 \times 1) + (5 \times 2) / (2 \times 2)$$

So we get

$$= (15 + 10) / 4$$

$$= 25/4 \text{ kg}$$

$$= 6 \frac{1}{4} \text{ kg}$$

7. Which is greater, $3/5$ or $7/10$ and by how much?

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Solution:

By cross multiplying

$$3 \times 10 = 30 \text{ and } 7 \times 5 = 35$$

Here 30 is smaller than 35

$$\text{So } 3/5 < 7/10$$

We know that difference between $7/10$ and $3/5$

$$= 7/10 - 3/5$$

LCM of 10 and 5 is 10

$$= (7 \times 1)/(10 \times 1) - (3 \times 2)/(5 \times 2)$$

So we get

$$= (7 - 6)/10$$

$$= 1/10$$

Therefore, $7/10$ is greater than $3/5$ by $1/10$.

8. What number should be added to $8 \frac{2}{3}$ to get $12 \frac{5}{6}$?**Solution:**

To find the fraction we must subtract $8 \frac{2}{3}$ from $12 \frac{5}{6}$

$$\text{So the required number} = 12 \frac{5}{6} - 8 \frac{2}{3}$$

It can be written as

$$= 77/6 - 26/3$$

Here the LCM of 3 and 6 is 6

$$= (77 \times 1)/(6 \times 1) - (26 \times 2)/(3 \times 2)$$

By further calculation

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$$= (77 - 52) / 6$$

$$= 25/6$$

$$= 4 \frac{1}{6}$$

9. What should be subtracted from $8 \frac{3}{4}$ to get $2 \frac{2}{3}$?

Solution:

$$\text{Required number} = 8 \frac{3}{4} - 2 \frac{2}{3}$$

It can be written as

$$= 35/4 - 8/3$$

LCM of 4 and 3 is 12

$$= (35 \times 3) / (4 \times 3) - (8 \times 4) / (3 \times 4)$$

By further calculation

$$= (105 - 32) / 12$$

$$= 73/12$$

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

10. A rectangular field is $16 \frac{1}{2}$ m long and $12 \frac{2}{5}$ m wide. Find the perimeter of the field.

Solution:

Dimensions of rectangular field are

$$\text{Length} = 16 \frac{1}{2} \text{ m}$$

$$\text{Breadth} = 12 \frac{2}{5} \text{ m}$$

$$\text{So the perimeter} = 2 (l + b)$$

Substituting the values

$$= 2 \times (16 \frac{1}{2} + 12 \frac{2}{5})$$

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It can be written as

$$= 2 \times (33/2 + 62/5)$$

LCM of 2 and 5 is 10

$$= 2 \times [(33 \times 5)/ (2 \times 5) + (62 \times 2)/ (5 \times 2)]$$

By further calculation

$$= 2 \times [(165 + 124)/ 10]$$

So we get

$$= 2 \times 289/10$$

$$= 289/5 \text{ m}$$

$$= 57 \frac{4}{5} \text{ m}$$

11. Sugar costs ₹ 37 $\frac{1}{2}$ per kg. Find the cost of 8 $\frac{3}{4}$ kg sugar.

Solution:

It is given that

Cost of 1 kg sugar = ₹ 37 $\frac{1}{2}$

So the cost of 8 $\frac{3}{4}$ kg sugar = $37 \frac{1}{2} \times 8 \frac{3}{4}$

It can be written as

$$= 75/2 \times 35/4$$

$$= 2625/8$$

$$= ₹ 328 \frac{1}{8}$$

12. A motor cycle runs 31 $\frac{1}{4}$ km consuming 1 litre of petrol. How much distance will it run consuming 1 $\frac{3}{5}$ litre of petrol?

Solution:

It is given that

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Distance covered consuming 1 litre petrol = $31 \frac{1}{4}$ km = $\frac{125}{4}$ km

So the distance covered consuming $1 \frac{3}{5}$ litre petrol = $\frac{125}{4} \times \frac{8}{5}$

= $\frac{1000}{20}$

= 50 km

13. A rectangular park has length = $23 \frac{2}{5}$ m and breadth = $16 \frac{2}{3}$ m. Find the area of the park.

Solution:

Dimensions of rectangular park are

Length = $23 \frac{2}{5}$ m = $\frac{117}{5}$ m

Breadth = $16 \frac{2}{3}$ m = $\frac{50}{3}$ m

So the area = $l \times b$

Substituting the values

= $\frac{117}{5} \times \frac{50}{3}$

= 39×10

= 390 m^2

14. Each of 40 identical boxes weighs $4 \frac{4}{5}$ kg. Find the total weight of all the boxes.

Solution:

It is given that

Weight of one box = $4 \frac{4}{5}$ kg = $\frac{24}{5}$ kg

So the weight of 40 boxes = $40 \times \frac{24}{5}$

= 8×24

= 192 kg

15. Out of 24 kg of wheat, $\frac{5}{6}$ th of wheat is consumed. Find, how much wheat is still left?

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Solution:

Wheat available = 24 kg

Wheat consumed = $\frac{5}{6}$ th of 24 kg

$$= \frac{5}{6} \times 24$$

$$= 20\text{kg}$$

So the remaining wheat = $24 - 20 \text{ kg} = 4 \text{ kg}$

16. A rod of length $2 \frac{2}{5}$ metre is divided into five equal parts. Find the length of each part so obtained.

Solution:

Length of rod = $\frac{2}{5}$ m

It is given that the length of rod should be divided into 5 equal parts

So the length of each part of rod = $2 \frac{2}{5} \div 5$

It can be written as

$$= \frac{12}{5} \times \frac{1}{5}$$

$$= \frac{12}{25} \text{ m}$$

17. If $A = 3 \frac{3}{8}$ and $B = 6 \frac{5}{8}$, find: (i) $A \div B$ (ii) $B \div A$.

Solution:

We know that

$$A = 3 \frac{3}{8} = \frac{27}{8}$$

$$B = 6 \frac{5}{8} = \frac{53}{8}$$

(i) $A \div B$

Substituting the values

$$= \frac{27}{8} \div \frac{53}{8}$$

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It can be written as

$$= 27/8 \times 8/53$$

$$= 27/53$$

(ii) $B \div A$

Substituting the values

$$= 53/8 \div 27/8$$

It can be written as

$$= 53/8 \times 8/27$$

$$= 53/27$$

$$= 1 \frac{26}{27}$$

18. Cost of $3 \frac{5}{7}$ litres of oil is ₹ $83 \frac{1}{2}$. Find the cost of one litre oil.

Solution:

It is given that

Cost of $3 \frac{5}{7}$ litres of oil = ₹ $83 \frac{1}{2}$

So the cost of one litre oil = ₹ $83 \frac{1}{2} \div 3 \frac{5}{7}$

It can be written as

$$= ₹ \frac{167}{2} \div \frac{26}{7}$$

We get

$$= ₹ \frac{167}{2} \times \frac{7}{26}$$

$$= ₹ \frac{1169}{52}$$

$$= ₹ 22 \frac{25}{52}$$

19. The product of two numbers is $20 \frac{5}{7}$. If one of these numbers is $6 \frac{2}{3}$, find the other.

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Solution:

It is given that

$$\text{Product of two numbers} = 20 \frac{5}{7} = \frac{145}{7}$$

$$\text{One number} = 6 \frac{2}{3} = \frac{20}{3}$$

$$\text{So the other number} = \frac{145}{7} \div \frac{20}{3}$$

By further calculation

$$= \frac{145}{7} \times \frac{3}{20}$$

So we get

$$= \frac{87}{28}$$

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

20. By what number should $5 \frac{5}{6}$ be multiplied to get $3 \frac{1}{3}$?

Solution:

$$\text{Here the required number} = 3 \frac{1}{3} \div 5 \frac{5}{6}$$

It can be written as

$$= \frac{10}{3} \div \frac{35}{6}$$

So we get

$$= \frac{10}{3} \times \frac{6}{35}$$

$$= \frac{4}{7}$$

Exercise 3D page: 49**Simplify:**

$$1. 6 + \{ \frac{4}{3} + (\frac{3}{4} - \frac{1}{3}) \}$$

Solution:

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It is given that

$$6 + \{4/3 + (3/4 - 1/3)\}$$

We can write it as

$$= 6 + \{4/3 + 3/4 - 1/3\}$$

By further calculation

$$= 6/1 + 4/3 + 3/4 - 1/3$$

Here the LCM of 3 and 4 is 12

$$= (72 + 16 + 9 - 4)/ 12$$

So we get

$$= (97 - 4)/ 12$$

$$= 93/12$$

$$= 31/4$$

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

$$2. 8 - \{3/2 + (3/5 - 1/2)\}$$

Solution:

It is given that

$$8 - \{3/2 + (3/5 - 1/2)\}$$

We can write it as

$$= 8 - \{3/2 + 3/5 - 1/2\}$$

By further calculation

$$= 8/1 - 3/2 - 3/5 + 1/2$$

Here the LCM of 2 and 5 is 10

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$$= (80 - 15 - 6 + 5) / 10$$

So we get

$$= (85 - 21) / 10$$

$$= 64/10$$

Dividing by 2

$$= 32/5$$

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

$$\text{3. } \frac{1}{4} (\frac{1}{4} + \frac{1}{3}) - \frac{2}{5}$$

Solution:

It is given that

$$\frac{1}{4} (\frac{1}{4} + \frac{1}{3}) - \frac{2}{5}$$

We can write it as

$$= \frac{1}{4} [(\frac{3}{12} + \frac{4}{12})] - \frac{2}{5}$$

By further calculation

$$= \frac{1}{4} \times \frac{7}{12} - \frac{2}{5}$$

$$= \frac{7}{48} - \frac{2}{5}$$

Here the LCM of 48 and 5 is 240

$$= \frac{(35 - 96)}{240}$$

So we get

$$= -\frac{61}{240}$$

$$\text{4. } 2 \frac{3}{4} - [3 \frac{1}{8} \div \{5 - (4 \frac{2}{3} - \frac{11}{12})\}]$$

Solution:

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It is given that

$$2\frac{3}{4} - [3\frac{1}{8} \div \{5 - (4\frac{2}{3} - 11/12)\}]$$

We can write it as

$$= 11/4 - [25/8 \div \{5 - (14/3 - 11/12)\}]$$

By further calculation

$$= 11/4 - [25/8 \div \{5 - (56 - 11)/12\}]$$

So we get

$$= 11/4 - [25/8 \div \{5 - 45/12\}]$$

LCM of 12 and 1 is 12

$$= 11/4 - [25/8 \div \{(60 - 45)/12\}]$$

By subtraction

$$= 11/4 - [25/8 \div 15/12]$$

We get

$$= 11/4 - [25/8 \times 12/15]$$

On further calculation

$$= 11/4 - 5/2$$

LCM of 4 and 2 is 4

$$= (11 - 10)/4$$

$$= 1/4$$

$$5. 12\frac{1}{2} - [8\frac{1}{2} + \{9 - (5 -)$$

Solution:

It is given that

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$$12 \frac{1}{2} - [8 \frac{1}{2} + \{9 - (5 - \overline{3 - 2})\}]$$

We can write it as

$$= 25/2 - [17/2 + \{9 - (5 - 1)\}]$$

By further calculation

$$= 25/2 - [17/2 + \{9 - 4\}]$$

So we get

$$= 25/2 - [17/2 + 5]$$

It can be written as

$$= 25/2 - 17/2 - 5/1$$

LCM of 2 and 1 is 2

$$= (25 - 17 - 10)/2$$

$$= (25 - 27)/2$$

We get

$$= -2/2$$

$$= -1$$

$$6. 1 \frac{1}{5} \div \{2 \frac{1}{3} - (5 + \overline{2 - 3})\} - 3 \frac{1}{2}$$

Solution:

It is given that

$$1 \frac{1}{5} \div \{2 \frac{1}{3} - (5 + \overline{2 - 3})\} - 3 \frac{1}{2}$$

$$= 1 \frac{1}{5} \div \{2 \frac{1}{3} - (5 - 1)\} - 3 \frac{1}{2}$$

We can write it as

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$$= 6/5 \div \{7/3 - (5 - 1)\} - 7/2$$

By further calculation

$$= 6/5 \div \{7/3 - 4\} - 7/2$$

LCM of 3 and 1 is 3

$$= 6/5 \div \{(7 - 12)/ 3\} - 7/2$$

So we get

$$= 6/5 \div -5/3 - 7/2$$

It can be write as

$$= 6/5 \times 3/-5 - 7/2$$

$$= - 18/25 - 7/2$$

LCM of 25 and 2 is 50

$$= (- 36 - 175)/ 50$$

$$= - 211/50$$

$$= - 4 \frac{11}{50}$$

$$7. (1/2 + 2/3) \div (3/4 - 2/9)$$

Solution:

It is given that

$$(1/2 + 2/3) \div (3/4 - 2/9)$$

LCM of 2 and 3 is 6 and 4 and 9 is 36

$$= (3 + 4)/ 6 \div (27 - 8)/ 36$$

By further calculation

$$= 7/6 \div 19/36$$

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We can write it as

$$= 7/6 \times 36/19$$

$$= 42/19$$

$$= 2 \frac{4}{19}$$

8. $6/5$ of $(3 \frac{1}{3} - 2 \frac{1}{2}) \div (2 \frac{5}{21} - 2)$

Solution:

It is given that

$$6/5 \text{ of } (3 \frac{1}{3} - 2 \frac{1}{2}) \div (2 \frac{5}{21} - 2)$$

We can write it as

$$= 6/5 \text{ of } (10/3 - 5/2) \div (47/21 - 2/1)$$

LCM of 3 and 2 is 6 and 1 and 21 is 21

$$= 6/5 \text{ of } [(20 - 15)/6] \div [(47 - 42)/21]$$

So we get

$$= 6/5 \text{ of } 5/6 \div 5/21$$

$$= 1 \div 5/21$$

It can be written as

$$= 1 \times 21/5$$

$$= 21/5$$

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

9. $10 \frac{1}{8}$ of $4/5 \div 35/36$ of $20/49$

Solution:

It is given that

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$$10 \frac{1}{8} \text{ of } \frac{4}{5} \div \frac{35}{36} \text{ of } \frac{20}{49}$$

We can write it as

$$= \frac{81}{8} \text{ of } \frac{4}{5} \div \frac{35}{36} \text{ of } \frac{20}{49}$$

By further calculation

$$= \frac{81}{10} \div \frac{25}{63}$$

So we get

$$= \frac{81}{10} \times \frac{63}{25}$$

$$= \frac{5103}{250}$$

$$= 20 \frac{103}{250}$$

$$10. \quad 5 \frac{3}{4} - \frac{3}{7} \times 15 \frac{3}{4} + 2 \frac{2}{35} \div 1 \frac{11}{25}$$

Solution:

It is given that

$$5 \frac{3}{4} - \frac{3}{7} \times 15 \frac{3}{4} + 2 \frac{2}{35} \div 1 \frac{11}{25}$$

We can write it as

$$= \frac{23}{4} - \frac{3}{7} \times \frac{63}{4} + \frac{72}{35} \div \frac{36}{25}$$

By further calculation

$$= \frac{23}{4} - \frac{3}{7} \times \frac{63}{4} + \frac{72}{35} \times \frac{25}{36}$$

So we get

$$= \frac{23}{4} - \frac{27}{4} + \frac{10}{7}$$

LCM of 4 and 7 is 28

$$= \frac{(161 - 189 + 40)}{28}$$

$$= \frac{12}{28}$$

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$$= 3/7$$

11. $3/4$ of $7\frac{3}{7} - 5\frac{3}{5} \div 3\frac{4}{15}$

Solution:

It is given that

$$3/4 \text{ of } 7\frac{3}{7} - 5\frac{3}{5} \div 3\frac{4}{15}$$

We can write it as

$$= 3/4 \text{ of } 52/7 - 28/5 \div 49/15$$

By further calculation

$$= 39/7 - 28/5 \div 49/15$$

So we get

$$= 39/7 - 28/5 \times 15/49$$

By multiplication

$$= 39/7 - 12/7$$

$$= (39 - 12)/7$$

$$= 27/7$$

$$= 3\frac{6}{7}$$

Exercise 3E page: 52

1. A line AB is of length 6 cm. Another line CD is of length 15 cm. What fraction is:

(i) the length of AB to that of CD?

(ii) $\frac{1}{2}$ the length of AB to that of $\frac{1}{3}$ of CD?

(iii) $\frac{1}{5}$ of CD to that of AB?

Solution:

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It is given that

Length of AB = 6 cm

Length of CD = 15 cm

(i) The length of AB to that of CD

$$= \frac{6}{15}$$

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

(ii) $\frac{1}{2}$ the length of AB to that of $\frac{1}{3}$ of CD

$$\frac{1}{2} \text{ of AB} = \frac{1}{2} \times 6 = 3 \text{ cm}$$

$$\frac{1}{3} \text{ of CD} = \frac{1}{3} \times 15 = 5 \text{ cm}$$

So $\frac{1}{2}$ the length of AB to that of $\frac{1}{3}$ of CD = $\frac{3}{5}$

(iii) $\frac{1}{5}$ of CD to that of AB

$$\frac{1}{5} \text{ of CD} = \frac{1}{5} \times 15 = 3 \text{ cm}$$

$$\frac{1}{5} \text{ of CD to that of AB} = \frac{3}{6} = \frac{1}{2}$$

2. Subtract $(\frac{2}{7} - \frac{5}{21})$ from the sum of $\frac{3}{4}$, $\frac{5}{7}$ and $\frac{7}{12}$.

Solution:

We can write it as

$$(\frac{3}{4} + \frac{5}{7} + \frac{7}{12}) - (\frac{2}{7} - \frac{5}{21})$$

LCM of 4, 7 and 12 is 84 and 7 and 21 is 21

$$= \frac{[(63 + 60 + 49)]}{84} - \frac{[(6 - 5)]}{21}$$

By further calculation

$$= \frac{172}{84} - \frac{1}{21}$$

LCM of 21 and 84 is 84

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$$= (172 - 4) / 84$$

$$= 168 / 84$$

$$= 2$$

3. From a sack of potatoes weighing 120 kg, a merchant sells portions weighing 6 kg, $5\frac{1}{4}$ kg, $9\frac{1}{2}$ kg and $9\frac{3}{4}$ kg respectively.

(i) How many kg did he sell?

(ii) How many kg are still left in the sack?

Solution:

Weight of potato = 120 kg

(i) Potatoes sold by merchant = 6 kg + $5\frac{1}{4}$ kg + $9\frac{1}{2}$ kg + $9\frac{3}{4}$ kg

It can be written as

$$= (6 + 21/4 + 19/2 + 39/4) \text{ kg}$$

LCM of 1, 4 and 2 is 4

$$= (24 + 21 + 38 + 39) / 4$$

By further calculation

$$= 122/4$$

$$= 61/2 \text{ kg}$$

$$= 30\frac{1}{2} \text{ kg}$$

(ii) Potatoes left in the sack = 120 kg – $30\frac{1}{2}$ kg

It can be written as

$$= (120/1 - 61/2) \text{ kg}$$

By further calculation

$$= (240 - 61) / 2$$

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So we get

$$= 179/2 \text{ kg}$$

$$= 89 \frac{1}{2} \text{ kg}$$

4. If a boy works for six consecutive days for 8 hours, $7 \frac{1}{2}$ hours, $8 \frac{1}{4}$ hours, $6 \frac{1}{4}$ hours, $6 \frac{3}{4}$ hours and 7 hours respectively, how much money will he earn at the rate of ₹ 36 per hour?

Solution:

Hours worked by a boy for six consecutive days = 8 hours + $7 \frac{1}{2}$ hours + $8 \frac{1}{4}$ hours + $6 \frac{1}{4}$ hours + $6 \frac{3}{4}$ hours + 7 hours

It can be written as

$$= (8 + 15/2 + 33/4 + 25/4 + 27/4 + 7) \text{ hours}$$

LCM of 2 and 4 is 4

$$= (32 + 30 + 33 + 25 + 27 + 28)/4 \text{ hours}$$

So we get

$$= 175/4 \text{ hours}$$

$$= 43 \frac{3}{4} \text{ hours}$$

He earned ₹ 36 per hour

$$\text{So the total earnings} = 175/4 \times 36$$

We get

$$= 175 \times 9$$

$$= ₹ 1575$$

5. A student bought $4 \frac{1}{3}$ m of yellow ribbon, $6 \frac{1}{6}$ m of red ribbon and $3 \frac{2}{9}$ m of blue ribbon decorating a room. How many metres of ribbon did he buy?

Solution:

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It is given that

Length of yellow ribbon = $4 \frac{1}{3} \text{ m} = \frac{13}{3} \text{ m}$

Length of red ribbon = $6 \frac{1}{6} \text{ m} = \frac{37}{6} \text{ m}$

Length of blue ribbon = $3 \frac{2}{9} \text{ m} = \frac{29}{9} \text{ m}$

So the total length = $\frac{13}{3} + \frac{37}{6} + \frac{29}{9}$

LCM of 3, 6 and 9 is 18

= $(78 + 111 + 58) / 18$

So we get

= $247 / 18$

= $13 \frac{13}{18} \text{ m}$

6. In a business, Ram and Deepak invest $\frac{3}{5}$ and $\frac{2}{5}$ of the total investment. If ₹ 40, 000 is the total investment, calculate the amount invested by each.

Solution:

It is given that

Total investment = ₹ 40, 000

Ram's investment = $\frac{3}{5}$ of ₹ 40, 000

It can be written as

= $\frac{3}{5} \times 40, 000$

By further calculation

= 3×8000

= ₹ 24, 000

Deepak's investment = $\frac{2}{5}$ of ₹ 40, 000

It can be written as

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$$= \frac{2}{5} \times 40,000$$

By further calculation

$$= 2 \times 8000$$

$$= ₹ 16,000$$

7. Geeta had 30 problems for home work. She worked out $\frac{2}{3}$ of them. How many problems were still left to be worked out by her?

Solution:

Number of problems Geeta had for home work = 30

Number of problems worked out by Geeta = $\frac{2}{3}$ of 30

We can write it as

$$= \frac{2}{3} \times 30$$

$$= 20$$

Number of problems still left to be worked out by her = $30 - 20 = 10$

8. A picture was marked at ₹ 90. It was sold at $\frac{3}{4}$ of its marked price. What was the sale price?

Solution:

It is given that

Marked price of picture = ₹ 90

Sale price of picture = $\frac{3}{4}$ of ₹ 90

We can write it as

$$= \frac{3}{4} \times 90$$

$$= ₹ 270/4$$

$$= ₹ 67 \frac{1}{2}$$

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= ₹ 67.50

9. Mani had sent fifteen parcels of oranges. What was the total weight of the parcels, if each weighed $10\frac{1}{2}$ kg?

Solution:

Number of parcels = 15

Weight of each parcel = $10\frac{1}{2}$ kg = $21/2$ kg

So the total weight of parcels = 15 of $21/2$ kg

We can write it as

$$= 21/2 \times 15 \text{ kg}$$

By further calculation

$$= 315/2$$

$$= 157\frac{1}{2} \text{ kg}$$

$$= 157.5 \text{ kg}$$

10. A rope is $25\frac{1}{2}$ m long. How many pieces each of $1\frac{1}{2}$ m length can be cut out from it?

Solution:

Length of rope = $25\frac{1}{2}$ m = $51/2$ m

Length of each piece = $1\frac{1}{2}$ m = $3/2$ m

So the number of pieces = $51/2 \div 3/2$

We can write it as

$$= 51/2 \times 2/3$$

$$= 17 \text{ pieces}$$

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11. The heights of two vertical poles, above the earth's surface, are $14 \frac{1}{4}$ m and $22 \frac{1}{3}$ m respectively. How much higher is the second pole as compared with the height of the first pole?

Solution:

It is given that

Height of first pole above the earth's surface = $14 \frac{1}{4}$ m

Height of second pole above the earth's surface = $22 \frac{1}{3}$ m

So height of second pole when compared to first pole = $22 \frac{1}{3} - 14 \frac{1}{4}$

We can write it as

$$= \frac{67}{3} - \frac{57}{4}$$

LCM of 3 and 4 is 12

$$= \frac{(268 - 171)}{12}$$

By further calculation

$$= \frac{97}{12} \text{ m}$$

$$= 8 \frac{1}{12} \text{ m}$$

12. Vijay weighed $65 \frac{1}{2}$ kg. He gained $1 \frac{2}{5}$ kg during the first week, $1 \frac{1}{4}$ kg during the second week, but lost $\frac{5}{16}$ kg during the third week. What was his weight after the third week?

Solution:

It is given that

Weight of Vijay = $65 \frac{1}{2}$ kg

Weight gained during first week = $1 \frac{2}{5}$ kg

Weight gained during second week = $1 \frac{1}{4}$ kg

Weight lost during third week = $\frac{5}{16}$ kg

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So the weight of Vijay after third week = $65 \frac{1}{2} + 1 \frac{2}{5} + 1 \frac{1}{4} - \frac{5}{16}$

It can be written as

$$= 131/2 + 7/5 + 5/4 - 5/16$$

LCM of 2, 5, 4 and 16 is 80

$$= (5240 + 112 + 100 - 25)/ 80$$

By further calculation

$$= (5452 - 25)/ 80$$

$$= 5427/80 \text{ kg}$$

$$= 67 \frac{67}{80} \text{ kg}$$

13. A man spends $\frac{2}{5}$ of his salary on food and $\frac{3}{10}$ on house rent, electricity, etc. What fraction of his salary is still left with him?

Solution:

Consider salary of man = ₹ 1

Salary spent on food = $\frac{2}{5}$ of ₹ 1 = ₹ $\frac{2}{5}$

Salary spent on house rent = $\frac{3}{10}$ of ₹ 1 = ₹ $\frac{3}{10}$

So the total salary spent = $\frac{2}{5} + \frac{3}{10}$

LCM of 5 and 10 is 10

$$= (4 + 3)/ 10$$

$$= 7/10$$

Salary still left with him = $1 - 7/10$

LCM of 1 and 10 is 10

$$= (10 - 7)/ 10$$

$$= 3/10$$

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14. A man spends $\frac{2}{5}$ of his salary on food and $\frac{3}{10}$ of the remaining on house rent, electricity, etc. What fraction of his salary is still left with him?

Solution:

Consider ₹ 1 as the total salary

Salary spent on food = $\frac{2}{5}$ of ₹ 1 = ₹ $\frac{2}{5}$

So the remaining salary = $1 - \frac{2}{5}$

It can be written as

$$= \frac{(5 - 2)}{5}$$

$$= ₹ \frac{3}{5}$$

Salary spent on house rent = $\frac{3}{10}$ of $\frac{3}{5}$ = ₹ $\frac{9}{50}$

So the remaining salary = $\frac{3}{5} - \frac{9}{50}$

LCM of 5 and 50 is 50

$$= \frac{(30 - 9)}{50}$$

$$= ₹ \frac{21}{50}$$

15. Shyam bought a refrigerator for ₹ 5,000. He paid $\frac{1}{10}$ of the price in cash and the rest in 12 equal monthly instalments. How much had he to pay each month?

Solution:

Total cost of refrigerator = ₹ 5000

Cash paid = $\frac{1}{10}$ of ₹ 5000

$$= \frac{1}{10} \times 5000$$

$$= ₹ 500$$

So the balance amount = $5000 - 500 = ₹ 4500$

Number of instalments = 12

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So the amount to be paid each month = $4500 \div 12$

We can write it as

$$= 4500 \times \frac{1}{12}$$

$$= ₹ 375$$

Exercise 3B

1. For each pair, given below, state whether it forms like fractions or unlike fractions:

(i) $\frac{5}{8}$ and $\frac{7}{8}$

(ii) $\frac{8}{15}$ and $\frac{8}{21}$

(iii) $\frac{4}{9}$ and $\frac{9}{4}$

Solution:

(i) $\frac{5}{8}$ and $\frac{7}{8}$ are like fractions.

(ii) $\frac{8}{15}$ and $\frac{8}{21}$ are unlike fractions.

(iii) $\frac{4}{9}$ and $\frac{9}{4}$ are unlike fractions.

2. Convert given fractions into fractions with equal denominators:

(i) $\frac{5}{6}$ and $\frac{7}{9}$

(ii) $\frac{2}{3}$, $\frac{5}{6}$ and $\frac{7}{12}$

(iii) $\frac{4}{5}$, $\frac{17}{20}$, $\frac{23}{20}$ and $\frac{11}{16}$

Solution:

(i) $\frac{5}{6}$ and $\frac{7}{9}$

Here the LCM of 6 and 9 is 18

$$\frac{5}{6} = \frac{(5 \times 3)}{(6 \times 3)} = \frac{15}{18}$$

$$\frac{7}{9} = \frac{(7 \times 2)}{(9 \times 2)} = \frac{14}{18}$$

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Therefore, $15/18$ and $14/18$ are the required fractions.

(ii) $2/3$, $5/6$ and $7/12$

Here the LCM of 3, 6 and 12 is 12

$$2/3 = (2 \times 4) / (3 \times 4) = 8/12$$

$$5/6 = (5 \times 2) / (6 \times 2) = 10/12$$

$$7/12 = 7/12$$

Therefore, $8/12$, $10/12$ and $7/12$ are the required fractions.

(iii) $4/5$, $17/20$, $23/40$ and $11/16$

Here the LCM of 5, 20, 40 and 16 is 80

$$4/5 = (4 \times 16) / (5 \times 16) = 64/80$$

$$17/20 = (17 \times 4) / (20 \times 4) = 68/80$$

$$23/40 = (23 \times 2) / (40 \times 2) = 46/80$$

$$11/16 = (11 \times 5) / (16 \times 5) = 55/80$$

Therefore, $64/80$, $68/80$, $46/80$ and $55/80$ are the required fractions.

3. Convert given fractions into fractions with equal numerators:

(i) $8/9$ and $12/17$

(ii) $6/13$, $15/23$ and $12/17$

(iii) $15/19$, $25/28$, $9/11$ and $45/47$

Solution:

(i) $8/9$ and $12/17$

Here the LCM of 8 and 12 is 24

$$8/9 = (8 \times 3) / (9 \times 3) = 24/27$$

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$$12/17 = (12 \times 2) / (17 \times 2) = 24/34$$

Therefore, 24/27 and 24/34 are the required fractions.

(ii) 6/13, 15/23 and 12/17

Here the LCM of 6, 15 and 12 is 60

$$6/13 = (6 \times 10) / (13 \times 10) = 60/130$$

$$15/23 = (15 \times 4) / (23 \times 4) = 60/92$$

$$12/17 = (12 \times 5) / (17 \times 5) = 60/85$$

Therefore, 60/130, 60/92 and 60/85 are the required fractions.

(iii) 15/19, 25/28, 9/11 and 45/47

Here the LCM of 15, 25, 9 and 45 is 225

$$15/19 = (15 \times 15) / (19 \times 15) = 225/285$$

$$25/28 = (25 \times 9) / (28 \times 9) = 225/252$$

$$9/11 = (9 \times 25) / (11 \times 25) = 225/275$$

$$45/47 = (45 \times 5) / (47 \times 5) = 225/235$$

Therefore, 225/285, 225/252, 225/275 and 225/235 are the required fractions.

4. Put the given fractions in ascending order by making denominators equal:

(i) 1/3, 2/5, 3/4 and 1/6

(ii) 5/6, 7/8, 11/12 and 3/10

(iii) 5/7, 3/8, 9/14 and 20/21

Solution:

(i) 1/3, 2/5, 3/4 and 1/6

Here the LCM of 3, 5, 4 and 6 is 60

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$$1/3 = (1 \times 20) / (3 \times 20) = 20/60$$

$$2/5 = (2 \times 12) / (5 \times 12) = 24/60$$

$$3/4 = (3 \times 15) / (4 \times 15) = 45/60$$

$$1/6 = (1 \times 10) / (6 \times 10) = 10/60$$

So we get

$$10/60 < 20/60 < 24/60 < 45/60$$

It can be written as

$$1/6 < 1/3 < 2/5 < 3/4$$

Therefore, $1/6$, $1/3$, $2/5$ and $3/4$ are in ascending order.

(ii) $5/6$, $7/8$, $11/12$ and $3/10$

Here the LCM of 6, 8, 12 and 10 is 240

$$5/6 = (5 \times 40) / (6 \times 40) = 200/240$$

$$7/8 = (7 \times 30) / (8 \times 30) = 210/240$$

$$11/12 = (11 \times 20) / (12 \times 20) = 220/240$$

$$3/10 = (3 \times 24) / (10 \times 24) = 72/240$$

So we get

$$72/240 < 200/240 < 210/240 < 220/240$$

It can be written as

$$3/10 < 5/6 < 7/8 < 11/12$$

Therefore, $3/10$, $5/6$, $7/8$ and $11/12$ are in ascending order.

(iii) $5/7$, $3/8$, $9/14$ and $20/21$

Here the LCM of 7, 8, 14 and 21 is 168

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$$5/7 = (5 \times 24) / (7 \times 24) = 120/168$$

$$3/8 = (3 \times 21) / (8 \times 21) = 63/168$$

$$9/14 = (9 \times 12) / (14 \times 12) = 108/168$$

$$20/21 = (20 \times 8) / (21 \times 8) = 160/168$$

So we get

$$63/168 < 108/168 < 120/168 < 160/168$$

It can be written as

$$3/8 < 9/14 < 5/7 < 20/21$$

Therefore, 3/8, 9/14, 5/7 and 20/21 are in ascending order.

5. Arrange the given fractions in descending order by making numerators equal:

(i) 5/6, 4/15, 8/9 and 1/3

(ii) 3/7, 4/9, 5/7 and 8/11

(iii) 1/10, 6/11, 8/11 and 3/5

Solution:

(i) 5/6, 4/15, 8/9 and 1/3

Here the LCM of 6, 15, 9 and 3 is 90

$$5/6 = (5 \times 15) / (6 \times 15) = 75/90$$

$$4/15 = (4 \times 6) / (15 \times 6) = 24/90$$

$$8/9 = (8 \times 10) / (9 \times 10) = 80/90$$

$$1/3 = (1 \times 30) / (3 \times 30) = 30/90$$

So we get

$$80/90 > 75/90 > 30/90 > 24/90$$

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It can be written as

$$8/9 > 5/6 > 1/3 > 4/15$$

Therefore, $8/9$, $5/6$, $1/3$ and $4/15$ are in descending order.

(ii) $3/7$, $4/9$, $5/7$ and $8/11$

Here the LCM of 3, 4, 5 and 8 is 120

$$3/7 = (3 \times 40) / (7 \times 40) = 120/280$$

$$4/9 = (4 \times 30) / (9 \times 30) = 120/270$$

$$5/7 = (5 \times 24) / (7 \times 24) = 120/168$$

$$8/11 = (8 \times 15) / (11 \times 15) = 120/165$$

So we get

$$120/165 > 120/168 > 120/270 > 120/280$$

It can be written as

$$8/11 > 5/7 > 4/9 > 3/7$$

Therefore, $8/11$, $5/7$, $4/9$ and $3/7$ are in descending order.

(iii) $1/10$, $6/11$, $8/11$ and $3/5$

Here the LCM of 1, 6, 8 and 3 is 24

$$1/10 = (1 \times 24) / (10 \times 24) = 24/240$$

$$6/11 = (6 \times 4) / (11 \times 4) = 24/44$$

$$8/11 = (8 \times 3) / (11 \times 3) = 24/33$$

$$3/5 = (3 \times 8) / (5 \times 8) = 24/40$$

So we get

$$24/33 > 24/40 > 24/44 > 24/240$$

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It can be written as

$$8/11 > 3/5 > 6/11 > 1/10$$

Therefore, 8/11, 3/5, 6/11 and 1/10 are in descending order.

6. Find the greater fraction:

(i) 3/5 and 11/15

(ii) 4/5 and 3/10

(iii) 6/7 and 5/9

Solution:

(i) 3/5 and 11/15

Here the LCM of 5 and 15 is 15

$$3/5 = (3 \times 3) / (5 \times 3) = 9/15$$

$$11/15 = 11/15$$

So we get, $11/15 > 9/15$

Therefore, 11/15 is greater.

(ii) 4/5 and 3/10

Here the LCM of 5 and 10 is 10

$$4/5 = (4 \times 2) / (5 \times 2) = 8/10$$

$$3/10 = 3/10$$

So we get, $8/10 > 3/10$

$$4/5 > 3/10$$

Therefore, 4/5 is greater.

(iii) 6/7 and 5/9

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Here LCM of 7 and 9 is 63

$$6/7 = (6 \times 9) / (7 \times 9) = 54/63$$

$$5/9 = (5 \times 7) / (9 \times 7) = 35/63$$

So we get, $54/63 > 35/63$

$$6/7 > 35/63$$

Therefore, $6/7$ is greater.

7. Insert one fraction between:

(i) $3/7$ and $4/9$

(ii) 2 and $8/3$

(iii) $9/17$ and $6/13$

Solution:

(i) $3/7$ and $4/9$

So the fraction between $3/7$ and $4/9$

$$= (3 + 4) / (7 + 9)$$

$$= 7/16$$

(ii) 2 and $8/3$

So the fraction between 2 and $8/3$

$$= (2 + 8) / (1 + 3)$$

$$= 10/4$$

Dividing by 2

$$= 5/2$$

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

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(iii) $9/17$ and $6/13$

So the fraction between $9/17$ and $6/13$

$$= (9 + 6) / (17 + 13)$$

$$= 15/30$$

By division

$$= 1/2$$

8. Insert three fractions between:

(i) $2/5$ and $4/9$

(ii) $1/2$ and $5/7$

(iii) $3/8$ and $6/11$

Solution:

(i) $2/5$ and $4/9$

So the fraction between $2/5$ and $4/9$

$$= (2 + 4) / (5 + 9)$$

By addition

$$= 6/14$$

Dividing by 2

$$= 3/7$$

Fraction between $2/5$ and $3/7$

$$= (2 + 3) / (5 + 7)$$

$$= 5/12$$

Fraction between $3/7$ and $4/9$

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$$= (3 + 4) / (7 + 9)$$

$$= 7/16$$

Therefore, three fractions between $2/5$ and $4/9$ will be $5/12$, $3/7$ and $7/16$.

(ii) $1/2$ and $5/7$

So the fraction between $1/2$ and $5/7$

$$= (1 + 5) / (2 + 7)$$

By addition

$$= 6/9$$

Dividing by 3

$$= 2/3$$

Fraction between $1/2$ and $2/3$

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

$$= 3/5$$

Fraction between $2/3$ and $5/7$

$$= (2 + 5) / (3 + 7)$$

$$= 7/10$$

Therefore, three fractions between $1/2$ and $5/7$ will be $3/5$, $2/3$ and $7/10$.

(iii) $3/8$ and $6/11$

So the fraction between $3/8$ and $6/11$

$$= (3 + 6) / (8 + 11)$$

$$= 9/19$$

Fraction between $3/8$ and $9/19$

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$$= (3 + 9) / (8 + 19)$$

$$= 12/27$$

$$= 4/9$$

Fraction between $9/19$ and $6/11$

$$= (9 + 6) / (19 + 11)$$

$$= 15/30$$

$$= 1/2$$

Therefore, three fractions between $3/8$ and $6/11$ will be $4/9$, $9/19$ and $1/2$.

9. Insert two fractions between:

(i) 1 and $3/11$

(ii) $5/9$ and $1/4$

(iii) $5/6$ and $1\frac{1}{5}$

Solution:

(i) 1 and $3/11$

Fraction between 1 and $3/11$

$$= (1 + 3) / (1 + 11)$$

By addition

$$= 4/12$$

$$= 1/3$$

Fraction between $1/3$ and $3/11$

$$= (1 + 3) / (3 + 11)$$

By addition

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$$= 4/14$$

Dividing by 2

$$= 2/7$$

Therefore, two fractions between 1 and $3/11$ will be $1/3$ and $2/7$.

(ii) $5/9$ and $1/4$

Fraction between $5/9$ and $1/4$

$$= (5 + 1)/ (9 + 4)$$

By addition

$$= 6/13$$

Fraction between $6/13$ and $1/4$

$$= (6 + 1)/ (13 + 4)$$

By addition

$$= 7/17$$

Therefore, two fractions between $5/9$ and $1/4$ will be $6/13$ and $7/17$.

(iii) $5/6$ and $1 \frac{1}{5}$

It can be written as

$$= 5/6 + 6/5$$

Fraction between $5/6$ and $6/5$

$$= (5 + 6)/ (6 + 5)$$

By addition

$$= 11/11$$

$$= 1$$

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Fraction between 1 and $\frac{6}{5}$

$$= (1 + 6) / (1 + 5)$$

By addition

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

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

Therefore, two fractions between $\frac{5}{6}$ and $1 \frac{1}{5}$ will be 1 and $1 \frac{1}{6}$.

Exercise 3C

1. Reduce to a single fraction:

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

(ii) $\frac{3}{5} - \frac{1}{10}$

(iii) $\frac{2}{3} - \frac{1}{6}$

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

(v) $\frac{1}{4} + \frac{5}{6} - \frac{1}{12}$

(vi) $\frac{2}{3} - \frac{3}{5} + 3 - \frac{1}{5}$

(vii) $\frac{2}{3} - \frac{1}{5} + \frac{1}{10}$

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

(ix) $2 \frac{5}{8} - 2 \frac{1}{6} + 4 \frac{3}{4}$

Solution:

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

Here the LCM of 2 and 3 is 6

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

By further calculation

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$$= 3/6 + 4/6$$

$$= (3 + 4)/6$$

So we get

$$= 7/6$$

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

$$(ii) \frac{3}{5} - \frac{1}{10}$$

Here the LCM of 5 and 10 is 10

$$= (3 \times 2)/ (5 \times 2) - 1/10$$

By further calculation

$$= 6/10 - 1/10$$

So we get

$$= (6 - 1)/10$$

$$= 5/10$$

$$= 1/2$$

$$(iii) \frac{2}{3} - \frac{1}{6}$$

Here the LCM of 3 and 6 is 6

$$= (2 \times 2)/ (3 \times 2) - 1/6$$

By further calculation

$$= 4/6 - 1/6$$

So we get

$$= (4 - 1)/6$$

$$= 3/6$$

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$$= 1/2$$

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

It can be written as

$$= 4/3 + 9/4$$

Here LCM of 3 and 4 is 12

$$= (4 \times 4)/(3 \times 4) + (9 \times 3)/(4 \times 3)$$

By further calculation

$$= 16/12 + 27/12$$

So we get

$$= (16 + 27)/12$$

$$= 43/12$$

$$= 3 \frac{7}{12}$$

$$(v) 1/4 + 5/6 - 1/12$$

Here LCM of 4, 6 and 12 is 12

$$= (1 \times 3)/(4 \times 3) + (5 \times 2)/(6 \times 2) - 1/12$$

By further calculation

$$= 3/12 + 10/12 - 1/12$$

So we get

$$= (3 + 10 - 1)/12$$

$$= 12/12$$

$$= 1$$

$$(vi) 2/3 - 3/5 + 3 - 1/5$$

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Here LCM of 3 and 5 is 15

$$= (2 \times 5) / (3 \times 5) - (3 \times 3) / (5 \times 3) + (3 \times 15) / 15 - (1 \times 3) / (5 \times 3)$$

By further calculation

$$= 10/15 - 9/15 + 45/15 - 3/15$$

So we get

$$= (10 - 9 + 45 - 3) / 15$$

$$= (55 - 12) / 15$$

$$= 43/15$$

$$= 2 \frac{13}{15}$$

(vii) $2/3 - 1/5 + 1/10$

Here the LCM of 3, 5 and 10 is 30

$$= (2 \times 10) / (3 \times 10) - (1 \times 6) / (5 \times 6) + (1 \times 3) / (10 \times 3)$$

By further calculation

$$= 20/30 - 6/30 + 3/30$$

So we get

$$= (20 - 6 + 3) / 30$$

$$= (23 - 6) / 30$$

$$= 17/30$$

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

It can be written as

$$= 5/2 + 7/3 - 5/4$$

Here the LCM of 2, 3 and 4 is 12

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$$= (5 \times 6) / (2 \times 6) + (7 \times 4) / (3 \times 4) - (5 \times 3) / (4 \times 3)$$

By further calculation

$$= 30/12 + 28/12 - 15/12$$

So we get

$$= (30 + 28 - 15) / 12$$

$$= (58 - 15) / 12$$

$$= 43/12$$

$$= 3 \frac{7}{12}$$

$$(ix) 2 \frac{5}{8} - 2 \frac{1}{6} + 4 \frac{3}{4}$$

It can be written as

$$= 21/8 - 13/6 + 19/4$$

Here the LCM of 8, 6 and 4 is 24

$$= (21 \times 3) / (8 \times 3) - (13 \times 4) / (6 \times 4) + (19 \times 6) / (4 \times 6)$$

By further calculation

$$= 63/24 - 52/24 + 114/24$$

So we get

$$= (63 - 52 + 114) / 24$$

$$= (177 - 52) / 24$$

$$= 125/24$$

$$= 5 \frac{5}{24}$$

2. Simplify:

$$(i) \frac{3}{4} \times 6$$

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(ii) $\frac{2}{3} \times 15$

(iii) $\frac{3}{4} \times \frac{1}{2}$

(iv) $\frac{9}{12} \times \frac{4}{7}$

(v) $45 \times 2 \frac{1}{3}$

(vi) $36 \times 3 \frac{1}{4}$

(vii) $2 \div \frac{1}{3}$

(viii) $3 \div \frac{2}{5}$

(ix) $1 \div \frac{3}{5}$

(x) $\frac{1}{3} \div \frac{1}{4}$

(xi) $-\frac{5}{8} \div \frac{3}{4}$

(xii) $3 \frac{3}{7} \div 1 \frac{1}{14}$

(xiii) $3 \frac{3}{4} \times 1 \frac{1}{5} \times \frac{20}{21}$

Solution:

(i) $\frac{3}{4} \times 6$

It can be written as

$$= \frac{3}{4} \times \frac{6}{1}$$

$$= \frac{(3 \times 6)}{(4 \times 1)}$$

So we get

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

HCF of 18 and 4 is 2

Dividing both numerator and denominator by 2

$$= \frac{(18 \div 2)}{(4 \div 2)}$$

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$$= 9/2$$

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

$$(ii) \frac{2}{3} \times 15$$

It can be written as

$$= \frac{2}{3} \times \frac{15}{1}$$

$$= (2 \times 15) / (3 \times 1)$$

So we get

$$= 30/3$$

$$= 10$$

$$(iii) \frac{3}{4} \times \frac{1}{2}$$

It can be written as

$$= (3 \times 1) / (4 \times 2)$$

$$= 3/8$$

$$(iv) \frac{9}{12} \times \frac{4}{7}$$

It can be written as

$$= (9 \times 4) / (12 \times 7)$$

So we get

$$= 36/84$$

Here the HCF of 36 and 84 is 12

Dividing both numerator and denominator by 12

$$= (36 \div 12) / (84 \div 12)$$

$$= 3/7$$

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(v) $45 \times 2 \frac{1}{3}$

It can be written as

$$= 45/1 \times 7/3$$

$$= (45 \times 7) / (1 \times 3)$$

So we get

$$= 315/3$$

$$= 105$$

(vi) $36 \times 3 \frac{1}{4}$

It can be written as

$$= 36/1 \times 13/4$$

$$= (36 \times 13) / (4 \times 1)$$

So we get

$$= 468/4$$

$$= 117$$

(vii) $2 \div 1/3$

It can be written as

$$= 2/1 \times 3/1$$

$$= (2 \times 3) / (1 \times 1)$$

So we get

$$= 6/1$$

$$= 6$$

(viii) $3 \div 2/5$

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It can be written as

$$= 3/1 \times 5/2$$

$$= (3 \times 5) / (1 \times 2)$$

So we get

$$= 15/2$$

$$= 7 \frac{1}{2}$$

(ix) $1 \div 3/5$

It can be written as

$$= 1 \times 5/3$$

$$= (1 \times 5) / 3$$

So we get

$$= 5/3$$

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

(x) $1/3 \div 1/4$

It can be written as

$$= 1/3 \times 4/1$$

$$= (1 \times 4) / (3 \times 1)$$

So we get

$$= 4/3$$

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

(xi) $-5/8 \div 3/4$

It can be written as

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$$= -5/8 \times 4/3$$

$$= (-5 \times 4) / (8 \times 3)$$

So we get

$$= -20/24$$

Here the HCF of 20 and 24 is 4

So by dividing both numerator and denominator by 4

$$= (-20 \div 4) / (24 \div 4)$$

$$= -5/6$$

(xii) $3 \frac{3}{7} \div 1 \frac{1}{14}$

It can be written as

$$= 24/7 \times 14/15$$

$$= (24 \times 14) / (7 \times 15)$$

So we get

$$= 336/105$$

Here the HCF of 336 and 105 is 21

So by dividing both numerator and denominator by 21

$$= (336 \div 21) / (105 \div 21)$$

$$= 16/5$$

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

(xiii) $3 \frac{3}{4} \times 1 \frac{1}{5} \times 20/21$

It can be written as

$$= 15/4 \times 6/5 \times 20/21$$

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$$= (15 \times 6 \times 20) / (4 \times 5 \times 21)$$

So we get

$$= 1800/420$$

Here the HCF of 1800 and 420 is 60

So by dividing both numerator and denominator by 60

$$= (1800 \div 60) / (420 \div 60)$$

$$= 30/7$$

$$= 4 \frac{2}{7}$$

3. Subtract:

(i) 2 from $\frac{2}{3}$

(ii) $\frac{1}{8}$ from $\frac{5}{8}$

(iii) $-\frac{2}{5}$ and $\frac{2}{5}$

(iv) $-\frac{3}{7}$ from $\frac{3}{7}$

(v) 0 from $-\frac{4}{5}$

(vi) $\frac{2}{9}$ from $\frac{4}{5}$

(vii) $-\frac{4}{7}$ from $-\frac{6}{11}$

Solution:

(i) 2 from $\frac{2}{3}$

It can be written as

$$= \frac{2}{3} - \frac{2}{1}$$

LCM of 3 and 1 is 3

$$= \frac{2}{3} - \frac{(2 \times 3)}{3}$$

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

So we get

$$= \frac{(2 - 6)}{3}$$

$$= -\frac{4}{3}$$

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

(ii) $\frac{1}{8}$ from $\frac{5}{8}$

It can be written as

$$= \frac{5}{8} - \frac{1}{8}$$

$$= \frac{(5 - 1)}{8}$$

So we get

$$= \frac{4}{8}$$

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

(iii) $-\frac{2}{5}$ and $\frac{2}{5}$

It can be written as

$$= \frac{2}{5} - (-\frac{2}{5})$$

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

So we get

$$= \frac{(2 + 2)}{5}$$

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

(iv) $-\frac{3}{7}$ from $\frac{3}{7}$

It can be written as

$$= \frac{3}{7} - (-\frac{3}{7})$$

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

So we get

$$= \frac{(3 + 3)}{7}$$

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

(v) 0 from $-\frac{4}{5}$

It can be written as

$$= -\frac{4}{5} - 0$$

$$= -\frac{4}{5}$$

(vi) $\frac{2}{9}$ from $\frac{4}{5}$

It can be written as

$$= \frac{4}{5} - \frac{2}{9}$$

LCM of 5 and 9 is 45

$$= \frac{(4 \times 9)}{(5 \times 9)} - \frac{(2 \times 5)}{(9 \times 5)}$$

By further calculation

$$= \frac{36}{45} - \frac{10}{45}$$

$$= \frac{(36 - 10)}{45}$$

$$= \frac{26}{45}$$

(vii) $-\frac{4}{7}$ from $-\frac{6}{11}$

It can be written as

$$= -\frac{6}{11} - (-\frac{4}{7})$$

$$= -\frac{6}{11} + \frac{4}{7}$$

Here LCM of 7 and 11 is 77

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$$= (-6 \times 7) / (11 \times 7) + (4 \times 11) / (7 \times 11)$$

By further calculation

$$= -42/77 + 44/77$$

So we get

$$= (-42 + 44) / 77$$

$$= 2/77$$

4. Find the value of:

(i) $\frac{1}{2}$ and 10 kg

(ii) $\frac{3}{5}$ of 1 hour

(iii) $\frac{4}{7}$ of $2\frac{1}{3}$ kg

(iv) $3\frac{1}{2}$ times of 2 metre

(v) $\frac{1}{2}$ of $2\frac{2}{3}$

(vi) $\frac{5}{11}$ of $\frac{4}{5}$ of 22 kg

Solution:

(i) $\frac{1}{2}$ and 10 kg

It can be written as

$$= (\frac{1}{2} \times 10) \text{ kg}$$

$$= 5 \text{ kg}$$

(ii) $\frac{3}{5}$ of 1 hour

It can be written as

$$= (\frac{3}{5} \times 60) \text{ minutes}$$

$$= 3 \times 12$$

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= 36 minutes

(iii) $\frac{4}{7}$ of $2\frac{1}{3}$ kg

It can be written as

$$= \left(\frac{4}{7} \times \frac{7}{3}\right) \text{ kg}$$

So we get

$$= \frac{4}{3} \text{ kg}$$

$$= 1\frac{1}{3} \text{ kg}$$

(iv) $3\frac{1}{2}$ times of 2 metre

It can be written as

$$= \left(\frac{7}{2} \times 2\right) \text{ metres}$$

$$= 7 \text{ metres}$$

(v) $\frac{1}{2}$ of $2\frac{2}{3}$

It can be written as

$$= \frac{1}{2} \times \frac{8}{3}$$

So we get

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

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

(vi) $\frac{5}{11}$ of $\frac{4}{5}$ of 22 kg

It can be written as

$$= \left(\frac{5}{11} \times \frac{4}{5} \times \frac{22}{1}\right) \text{ kg}$$

So we get

$$= 4 \times 2$$

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= 8 kg

5. Simplify and reduce to a simple fraction:

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

(ii) $\frac{3}{5} \div 7$

(iii) $\frac{3}{5} \div 7$

(iv) $2\frac{1}{5} \div 1\frac{1}{10}$

(v) $\frac{2}{5}$ of $\frac{6}{11} \times 1\frac{1}{4}$

(vi) $2\frac{1}{4} \div \frac{1}{7} \times \frac{1}{3}$

(vii) $\frac{1}{3} \times 4\frac{2}{3} \div 3\frac{1}{2} \times \frac{1}{2}$

(viii) $\frac{2}{3} \times 1\frac{1}{4} \div \frac{3}{7}$ of $2\frac{5}{8}$

(ix) $0 \div \frac{8}{11}$

(x) $\frac{4}{5} \div \frac{7}{15}$ of $\frac{8}{9}$

(xi) $\frac{4}{5} \div \frac{7}{15} \times \frac{8}{9}$

(xii) $\frac{4}{5}$ of $\frac{7}{15} \div \frac{8}{9}$

(xiii) $\frac{1}{2}$ of $\frac{3}{4} \times \frac{1}{2} \div \frac{2}{3}$

Solution:

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

It can be written as

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

So we get

$$= (3 \times 4) / 15$$

$$= 4/5$$

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(ii) $\frac{3}{5} \div 7$

It can be written as

$$= \frac{3}{5} \times \frac{1}{7}$$

$$= \frac{3}{35}$$

(iii) $\frac{3}{5} \div \frac{5}{7}$

It can be written as

$$= 3 \times \frac{7}{5}$$

So we get

$$= \frac{21}{5}$$

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

(iv) $2 \frac{1}{5} \div 1 \frac{1}{10}$

It can be written as

$$= \frac{11}{5} \div \frac{11}{10}$$

So we get

$$= \frac{11}{5} \times \frac{10}{11}$$

$$= 2$$

(v) $\frac{2}{5}$ of $\frac{6}{11} \times 1 \frac{1}{4}$

It can be written as

$$= \frac{2}{5} \text{ of } \frac{6}{11} \times \frac{5}{4}$$

So we get

$$= \frac{12}{55} \times \frac{5}{4}$$

$$= \frac{3}{11}$$

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(vi) $2\frac{1}{4} \div \frac{1}{7} \times \frac{1}{3}$

It can be written as

$$= \frac{9}{4} \div \frac{1}{7} \times \frac{1}{3}$$

So we get

$$= \frac{9}{4} \times \frac{7}{1} \times \frac{1}{3}$$

$$= \frac{21}{4}$$

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

(vii) $\frac{1}{3} \times 4\frac{2}{3} \div 3\frac{1}{2} \times \frac{1}{2}$

It can be written as

$$= \frac{1}{3} \times \frac{14}{3} \div \frac{7}{2} \times \frac{1}{2}$$

So we get

$$= \frac{1}{3} \times \frac{14}{3} \times \frac{2}{7} \times \frac{1}{2}$$

$$= \frac{2}{9}$$

(viii) $\frac{2}{3} \times 1\frac{1}{4} \div \frac{3}{7}$ of $2\frac{5}{8}$

It can be written as

$$= \frac{2}{3} \times \frac{5}{4} \div \frac{3}{7} \text{ of } \frac{21}{8}$$

So we get

$$= \frac{2}{3} \times \frac{5}{4} \div \frac{9}{8}$$

Here

$$= \frac{2}{3} \times \frac{5}{4} \times \frac{8}{9}$$

$$= \frac{20}{27}$$

(ix) $0 \div \frac{8}{11}$

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It can be written as

$$= 0 \times 11/8$$

$$= 0$$

(x) $4/5 \div 7/15$ of $8/9$

From BODMAS rule

$$= 4/5 \div 156/135$$

So we get

$$= 4/5 \times 135/56$$

$$= 27/14$$

$$= 1 \frac{13}{14}$$

(xi) $4/5 \div 7/15 \times 8/9$

It can be written as

$$= 4/5 \times 15/7 \times 8/9$$

So we get

$$= 32/21$$

$$= 1 \frac{11}{21}$$

(xii) $4/5$ of $7/15 \div 8/9$

From BODMAS rule

$$= 28/75 \div 8/9$$

So we get

$$= 28/75 \times 9/8$$

By further calculation

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$$= (7 \times 3) / (25 \times 2)$$

$$= 21/50$$

(xiii) $1/2$ of $3/4 \times 1/2 \div 2/3$

From BODMAS rule

$$= 3/8 \times 1/2 \div 2/3$$

So we get

$$= 3/8 \times 1/2 \times 3/2$$

$$= 9/32$$

6. A bought $3 \frac{3}{4}$ kg of wheat and $2 \frac{1}{2}$ kg of rice. Find the total weight wheat and rice bought.

Solution:

It is given that

$$\text{Weight of wheat} = 3 \frac{3}{4} \text{ kg} = 15/4 \text{ kg}$$

$$\text{Weight of rice} = 2 \frac{1}{2} \text{ kg} = 5/2 \text{ kg}$$

$$\text{So the total weight of wheat and rice} = 15/4 + 5/2$$

Here the LCM of 4 and 2 is 4

$$= (15 \times 1) / (4 \times 1) + (5 \times 2) / (2 \times 2)$$

So we get

$$= (15 + 10) / 4$$

$$= 25/4 \text{ kg}$$

$$= 6 \frac{1}{4} \text{ kg}$$

7. Which is greater, $3/5$ or $7/10$ and by how much?

Solution:

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By cross multiplying

$$3 \times 10 = 30 \text{ and } 7 \times 5 = 35$$

Here 30 is smaller than 35

$$\text{So } 3/5 < 7/10$$

We know that difference between $7/10$ and $3/5$

$$= 7/10 - 3/5$$

LCM of 10 and 5 is 10

$$= (7 \times 1) / (10 \times 1) - (3 \times 2) / (5 \times 2)$$

So we get

$$= (7 - 6) / 10$$

$$= 1/10$$

Therefore, $7/10$ is greater than $3/5$ by $1/10$.

8. What number should be added to $8 \frac{2}{3}$ to get $12 \frac{5}{6}$?

Solution:

To find the fraction we must subtract $8 \frac{2}{3}$ from $12 \frac{5}{6}$

$$\text{So the required number} = 12 \frac{5}{6} - 8 \frac{2}{3}$$

It can be written as

$$= 77/6 - 26/3$$

Here the LCM of 3 and 6 is 6

$$= (77 \times 1) / (6 \times 1) - (26 \times 2) / (3 \times 2)$$

By further calculation

$$= (77 - 52) / 6$$

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$$= 25/6$$

$$= 4 \frac{1}{6}$$

9. What should be subtracted from $8 \frac{3}{4}$ to get $2 \frac{2}{3}$?

Solution:

$$\text{Required number} = 8 \frac{3}{4} - 2 \frac{2}{3}$$

It can be written as

$$= 35/4 - 8/3$$

LCM of 4 and 3 is 12

$$= (35 \times 3)/(4 \times 3) - (8 \times 4)/(3 \times 4)$$

By further calculation

$$= (105 - 32)/12$$

$$= 73/12$$

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

10. A rectangular field is $16 \frac{1}{2}$ m long and $12 \frac{2}{5}$ m wide. Find the perimeter of the field.

Solution:

Dimensions of rectangular field are

$$\text{Length} = 16 \frac{1}{2} \text{ m}$$

$$\text{Breadth} = 12 \frac{2}{5} \text{ m}$$

$$\text{So the perimeter} = 2(l + b)$$

Substituting the values

$$= 2 \times (16 \frac{1}{2} + 12 \frac{2}{5})$$

It can be written as

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$$= 2 \times (33/2 + 62/5)$$

LCM of 2 and 5 is 10

$$= 2 \times [(33 \times 5)/(2 \times 5) + (62 \times 2)/(5 \times 2)]$$

By further calculation

$$= 2 \times [(165 + 124)/10]$$

So we get

$$= 2 \times 289/10$$

$$= 289/5 \text{ m}$$

$$= 57 \frac{4}{5} \text{ m}$$

11. Sugar costs ₹ 37 $\frac{1}{2}$ per kg. Find the cost of 8 $\frac{3}{4}$ kg sugar.

Solution:

It is given that

Cost of 1 kg sugar = ₹ 37 $\frac{1}{2}$

So the cost of 8 $\frac{3}{4}$ kg sugar = $37 \frac{1}{2} \times 8 \frac{3}{4}$

It can be written as

$$= 75/2 \times 35/4$$

$$= 2625/8$$

$$= ₹ 328 \frac{1}{8}$$

12. A motor cycle runs 31 $\frac{1}{4}$ km consuming 1 litre of petrol. How much distance will it run consuming 1 $\frac{3}{5}$ litre of petrol?

Solution:

It is given that

Distance covered consuming 1 litre petrol = 31 $\frac{1}{4}$ km = $125/4$ km

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So the distance covered consuming $1\frac{3}{5}$ litre petrol = $125/4 \times 8/5$

$$= 1000/20$$

$$= 50 \text{ km}$$

13. A rectangular park has length = $23\frac{2}{5}$ m and breadth = $16\frac{2}{3}$ m. Find the area of the park.

Solution:

Dimensions of rectangular park are

$$\text{Length} = 23\frac{2}{5} \text{ m} = 117/5 \text{ m}$$

$$\text{Breadth} = 16\frac{2}{3} \text{ m} = 50/3 \text{ m}$$

$$\text{So the area} = l \times b$$

Substituting the values

$$= 117/5 \times 50/3$$

$$= 39 \times 10$$

$$= 390 \text{ m}^2$$

14. Each of 40 identical boxes weighs $4\frac{4}{5}$ kg. Find the total weight of all the boxes.

Solution:

It is given that

$$\text{Weight of one box} = 4\frac{4}{5} \text{ kg} = 24/5 \text{ kg}$$

$$\text{So the weight of 40 boxes} = 40 \times 24/5$$

$$= 8 \times 24$$

$$= 192 \text{ kg}$$

15. Out of 24 kg of wheat, $5/6^{\text{th}}$ of wheat is consumed. Find, how much wheat is still left?

Solution:

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Wheat available = 24 kg

Wheat consumed = $\frac{5}{6}$ th of 24 kg

$$= \frac{5}{6} \times 24$$

$$= 20\text{kg}$$

So the remaining wheat = $24 - 20 \text{ kg} = 4 \text{ kg}$

16. A rod of length $2\frac{2}{5}$ metre is divided into five equal parts. Find the length of each part so obtained.

Solution:

Length of rod = $\frac{2}{5}$ m

It is given that the length of rod should be divided into 5 equal parts

So the length of each part of rod = $2\frac{2}{5} \div 5$

It can be written as

$$= \frac{12}{5} \times \frac{1}{5}$$

$$= \frac{12}{25} \text{ m}$$

17. If $A = 3\frac{3}{8}$ and $B = 6\frac{5}{8}$, find: (i) $A \div B$ (ii) $B \div A$.

Solution:

We know that

$$A = 3\frac{3}{8} = \frac{27}{8}$$

$$B = 6\frac{5}{8} = \frac{53}{8}$$

(i) $A \div B$

Substituting the values

$$= \frac{27}{8} \div \frac{53}{8}$$

It can be written as

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$$= 27/8 \times 8/53$$

$$= 27/53$$

(ii) $B \div A$

Substituting the values

$$= 53/8 \div 27/8$$

It can be written as

$$= 53/8 \times 8/27$$

$$= 53/27$$

$$= 1 \frac{26}{27}$$

18. Cost of $3 \frac{5}{7}$ litres of oil is ₹ $83 \frac{1}{2}$. Find the cost of one litre oil.

Solution:

It is given that

$$\text{Cost of } 3 \frac{5}{7} \text{ litres of oil} = ₹ 83 \frac{1}{2}$$

$$\text{So the cost of one litre oil} = ₹ 83 \frac{1}{2} \div 3 \frac{5}{7}$$

It can be written as

$$= ₹ 167/2 \div 26/7$$

We get

$$= ₹ 167/2 \times 7/26$$

$$= ₹ 1169/52$$

$$= ₹ 22 \frac{25}{52}$$

19. The product of two numbers is $20 \frac{5}{7}$. If one of these numbers is $6 \frac{2}{3}$, find the other.

Solution:

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It is given that

$$\text{Product of two numbers} = 20 \frac{5}{7} = \frac{145}{7}$$

$$\text{One number} = 6 \frac{2}{3} = \frac{20}{3}$$

$$\text{So the other number} = \frac{145}{7} \div \frac{20}{3}$$

By further calculation

$$= \frac{145}{7} \times \frac{3}{20}$$

So we get

$$= \frac{87}{28}$$

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

20. By what number should $5 \frac{5}{6}$ be multiplied to get $3 \frac{1}{3}$?

Solution:

$$\text{Here the required number} = 3 \frac{1}{3} \div 5 \frac{5}{6}$$

It can be written as

$$= \frac{10}{3} \div \frac{35}{6}$$

So we get

$$= \frac{10}{3} \times \frac{6}{35}$$

$$= \frac{4}{7}$$

Exercise 3D

Simplify:

$$1. 6 + \left\{ \frac{4}{3} + \left(\frac{3}{4} - \frac{1}{3} \right) \right\}$$

Solution:

It is given that

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$$6 + \{4/3 + (3/4 - 1/3)\}$$

We can write it as

$$= 6 + \{4/3 + 3/4 - 1/3\}$$

By further calculation

$$= 6/1 + 4/3 + 3/4 - 1/3$$

Here the LCM of 3 and 4 is 12

$$= (72 + 16 + 9 - 4)/ 12$$

So we get

$$= (97 - 4)/ 12$$

$$= 93/12$$

$$= 31/4$$

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

$$2. 8 - \{3/2 + (3/5 - 1/2)\}$$

Solution:

It is given that

$$8 - \{3/2 + (3/5 - 1/2)\}$$

We can write it as

$$= 8 - \{3/2 + 3/5 - 1/2\}$$

By further calculation

$$= 8/1 - 3/2 - 3/5 + 1/2$$

Here the LCM of 2 and 5 is 10

$$= (80 - 15 - 6 + 5)/ 10$$

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So we get

$$= (85 - 21) / 10$$

$$= 64/10$$

Dividing by 2

$$= 32/5$$

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

$$\text{3. } \frac{1}{4} \left(\frac{1}{4} + \frac{1}{3} \right) - \frac{2}{5}$$

Solution:

It is given that

$$\frac{1}{4} \left(\frac{1}{4} + \frac{1}{3} \right) - \frac{2}{5}$$

We can write it as

$$= \frac{1}{4} \left[\left(\frac{3}{12} + \frac{4}{12} \right) \right] - \frac{2}{5}$$

By further calculation

$$= \frac{1}{4} \times \frac{7}{12} - \frac{2}{5}$$

$$= \frac{7}{48} - \frac{2}{5}$$

Here the LCM of 48 and 5 is 240

$$= \frac{(35 - 96)}{240}$$

So we get

$$= -\frac{61}{240}$$

$$\text{4. } 2 \frac{3}{4} - \left[3 \frac{1}{8} \div \left\{ 5 - \left(4 \frac{2}{3} - \frac{11}{12} \right) \right\} \right]$$

Solution:

It is given that

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$$2\frac{3}{4} - [3\frac{1}{8} \div \{5 - (4\frac{2}{3} - 11/12)\}]$$

We can write it as

$$= 11/4 - [25/8 \div \{5 - (14/3 - 11/12)\}]$$

By further calculation

$$= 11/4 - [25/8 \div \{5 - (56 - 11)/12\}]$$

So we get

$$= 11/4 - [25/8 \div \{5 - 45/12\}]$$

LCM of 12 and 1 is 12

$$= 11/4 - [25/8 \div \{(60 - 45)/12\}]$$

By subtraction

$$= 11/4 - [25/8 \div 15/12]$$

We get

$$= 11/4 - [25/8 \times 12/15]$$

On further calculation

$$= 11/4 - 5/2$$

LCM of 4 and 2 is 4

$$= (11 - 10)/4$$

$$= 1/4$$

5. $12\frac{1}{2} - [8\frac{1}{2} + \{9 - (5 -)$

Solution:

It is given that

$$12\frac{1}{2} - [8\frac{1}{2} + \{9 - (5 -$$

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$$\overline{3 - 2})$$

We can write it as

$$= 25/2 - [17/2 + \{9 - (5 - 1)\}]$$

By further calculation

$$= 25/2 - [17/2 + \{9 - 4\}]$$

So we get

$$= 25/2 - [17/2 + 5]$$

It can be written as

$$= 25/2 - 17/2 - 5/1$$

LCM of 2 and 1 is 2

$$= (25 - 17 - 10)/2$$

$$= (25 - 27)/2$$

We get

$$= -2/2$$

$$= -1$$

$$6. \ 1 \frac{1}{5} \div \{2 \frac{1}{3} - (5 +)\} - 3 \frac{1}{2}$$

Solution:

It is given that

$$1 \frac{1}{5} \div \{2 \frac{1}{3} - (5 +$$

$$\overline{2 - 3})\} - 3 \frac{1}{2}$$

We can write it as

$$= 6/5 \div \{7/3 - (5 - 1)\} - 7/2$$

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By further calculation

$$= 6/5 \div \{7/3 - 4\} - 7/2$$

LCM of 3 and 1 is 3

$$= 6/5 \div \{(7 - 12)/ 3\} - 7/2$$

So we get

$$= 6/5 \div -5/3 - 7/2$$

It can be write as

$$= 6/5 \times 3/-5 - 7/2$$

$$= - 18/25 - 7/2$$

LCM of 25 and 2 is 50

$$= (- 36 - 175)/ 50$$

$$= - 211/50$$

$$= - 4 \frac{11}{50}$$

$$7. (1/2 + 2/3) \div (3/4 - 2/9)$$

Solution:

It is given that

$$(1/2 + 2/3) \div (3/4 - 2/9)$$

LCM of 2 and 3 is 6 and 4 and 9 is 36

$$= (3 + 4)/ 6 \div (27 - 8)/ 36$$

By further calculation

$$= 7/6 \div 19/36$$

We can write it as

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$$= 7/6 \times 36/19$$

$$= 42/19$$

$$= 2 \frac{4}{19}$$

8. $6/5$ of $(3 \frac{1}{3} - 2 \frac{1}{2}) \div (2 \frac{5}{21} - 2)$

Solution:

It is given that

$$6/5 \text{ of } (3 \frac{1}{3} - 2 \frac{1}{2}) \div (2 \frac{5}{21} - 2)$$

We can write it as

$$= 6/5 \text{ of } (10/3 - 5/2) \div (47/21 - 2/1)$$

LCM of 3 and 2 is 6 and 1 and 21 is 21

$$= 6/5 \text{ of } [(20 - 15)/6] \div [(47 - 42)/21]$$

So we get

$$= 6/5 \text{ of } 5/6 \div 5/21$$

$$= 1 \div 5/21$$

It can be written as

$$= 1 \times 21/5$$

$$= 21/5$$

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

9. $10 \frac{1}{8}$ of $4/5 \div 35/36$ of $20/49$

Solution:

It is given that

$$10 \frac{1}{8} \text{ of } 4/5 \div 35/36 \text{ of } 20/49$$

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We can write it as

$$= 81/8 \text{ of } 4/5 \div 35/36 \text{ of } 20/49$$

By further calculation

$$= 81/10 \div 25/63$$

So we get

$$= 81/10 \times 63/25$$

$$= 5103/250$$

$$= 20 \frac{103}{250}$$

$$10. \ 5 \frac{3}{4} - \frac{3}{7} \times 15 \frac{3}{4} + 2 \frac{2}{35} \div 1 \frac{11}{25}$$

Solution:

It is given that

$$5 \frac{3}{4} - \frac{3}{7} \times 15 \frac{3}{4} + 2 \frac{2}{35} \div 1 \frac{11}{25}$$

We can write it as

$$= 23/4 - \frac{3}{7} \times 63/4 + 72/35 \div 36/25$$

By further calculation

$$= 23/4 - \frac{3}{7} \times 63/4 + 72/35 \times 25/36$$

So we get

$$= 23/4 - 27/4 + 10/7$$

LCM of 4 and 7 is 28

$$= (161 - 189 + 40)/28$$

$$= 12/28$$

$$= 3/7$$

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11. $\frac{3}{4}$ of $7\frac{3}{7} - 5\frac{3}{5} \div 3\frac{4}{15}$

Solution:

It is given that

$$\frac{3}{4} \text{ of } 7\frac{3}{7} - 5\frac{3}{5} \div 3\frac{4}{15}$$

We can write it as

$$= \frac{3}{4} \text{ of } \frac{52}{7} - \frac{28}{5} \div \frac{49}{15}$$

By further calculation

$$= \frac{39}{7} - \frac{28}{5} \div \frac{49}{15}$$

So we get

$$= \frac{39}{7} - \frac{28}{5} \times \frac{15}{49}$$

By multiplication

$$= \frac{39}{7} - \frac{12}{7}$$

$$= \frac{(39 - 12)}{7}$$

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

$$= 3\frac{6}{7}$$

Exercise 3E

1. A line AB is of length 6 cm. Another line CD is of length 15 cm. What fraction is:

(i) the length of AB to that of CD?

(ii) $\frac{1}{2}$ the length of AB to that of $\frac{1}{3}$ of CD?

(iii) $\frac{1}{5}$ of CD to that of AB?

Solution:

It is given that

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Length of AB = 6 cm

Length of CD = 15 cm

(i) The length of AB to that of CD

$$= 6/15$$

$$= 2/5$$

(ii) $\frac{1}{2}$ the length of AB to that of $\frac{1}{3}$ of CD

$$\frac{1}{2} \text{ of AB} = \frac{1}{2} \times 6 = 3 \text{ cm}$$

$$\frac{1}{3} \text{ of CD} = \frac{1}{3} \times 15 = 5 \text{ cm}$$

So $\frac{1}{2}$ the length of AB to that of $\frac{1}{3}$ of CD = $\frac{3}{5}$

(iii) $\frac{1}{5}$ of CD to that of AB

$$\frac{1}{5} \text{ of CD} = \frac{1}{5} \times 15 = 3 \text{ cm}$$

$$\frac{1}{5} \text{ of CD to that of AB} = \frac{3}{6} = \frac{1}{2}$$

2. Subtract $(\frac{2}{7} - \frac{5}{21})$ from the sum of $\frac{3}{4}$, $\frac{5}{7}$ and $\frac{7}{12}$.

Solution:

We can write it as

$$(\frac{3}{4} + \frac{5}{7} + \frac{7}{12}) - (\frac{2}{7} - \frac{5}{21})$$

LCM of 4, 7 and 12 is 84 and 7 and 21 is 21

$$= [(63 + 60 + 49)/ 84] - [(6 - 5)/ 21]$$

By further calculation

$$= 172/84 - 1/21$$

LCM of 21 and 84 is 84

$$= (172 - 4)/ 84$$

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$$= 168/84$$

$$= 2$$

3. From a sack of potatoes weighing 120 kg, a merchant sells portions weighing 6 kg, $5\frac{1}{4}$ kg, $9\frac{1}{2}$ kg and $9\frac{3}{4}$ kg respectively.

(i) How many kg did he sell?

(ii) How many kg are still left in the sack?

Solution:

Weight of potato = 120 kg

(i) Potatoes sold by merchant = 6 kg + $5\frac{1}{4}$ kg + $9\frac{1}{2}$ kg + $9\frac{3}{4}$ kg

It can be written as

$$= (6 + 21/4 + 19/2 + 39/4) \text{ kg}$$

LCM of 1, 4 and 2 is 4

$$= (24 + 21 + 38 + 39)/4$$

By further calculation

$$= 122/4$$

$$= 61/2 \text{ kg}$$

$$= 30\frac{1}{2} \text{ kg}$$

(ii) Potatoes left in the sack = 120 kg – $30\frac{1}{2}$ kg

It can be written as

$$= (120/1 - 61/2) \text{ kg}$$

By further calculation

$$= (240 - 61)/2$$

So we get

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$$= 179/2 \text{ kg}$$

$$= 89 \frac{1}{2} \text{ kg}$$

4. If a boy works for six consecutive days for 8 hours, $7 \frac{1}{2}$ hours, $8 \frac{1}{4}$ hours, $6 \frac{1}{4}$ hours, $6 \frac{3}{4}$ hours and 7 hours respectively, how much money will he earn at the rate of ₹ 36 per hour?

Solution:

Hours worked by a boy for six consecutive days = 8 hours + $7 \frac{1}{2}$ hours + $8 \frac{1}{4}$ hours + $6 \frac{1}{4}$ hours + $6 \frac{3}{4}$ hours + 7 hours

It can be written as

$$= (8 + 15/2 + 33/4 + 25/4 + 27/4 + 7) \text{ hours}$$

LCM of 2 and 4 is 4

$$= (32 + 30 + 33 + 25 + 27 + 28)/4 \text{ hours}$$

So we get

$$= 175/4 \text{ hours}$$

$$= 43 \frac{3}{4} \text{ hours}$$

He earned ₹ 36 per hour

$$\text{So the total earnings} = 175/4 \times 36$$

We get

$$= 175 \times 9$$

$$= ₹ 1575$$

5. A student bought $4 \frac{1}{3}$ m of yellow ribbon, $6 \frac{1}{6}$ m of red ribbon and $3 \frac{2}{9}$ m of blue ribbon decorating a room. How many metres of ribbon did he buy?

Solution:

It is given that

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Length of yellow ribbon = $4 \frac{1}{3} \text{ m} = \frac{13}{3} \text{ m}$

Length of red ribbon = $6 \frac{1}{6} \text{ m} = \frac{37}{6} \text{ m}$

Length of blue ribbon = $3 \frac{2}{9} \text{ m} = \frac{29}{9} \text{ m}$

So the total length = $\frac{13}{3} + \frac{37}{6} + \frac{29}{9}$

LCM of 3, 6 and 9 is 18

= $(78 + 111 + 58) / 18$

So we get

= $247 / 18$

= $13 \frac{13}{18} \text{ m}$

6. In a business, Ram and Deepak invest $\frac{3}{5}$ and $\frac{2}{5}$ of the total investment. If ₹ 40, 000 is the total investment, calculate the amount invested by each.

Solution:

It is given that

Total investment = ₹ 40, 000

Ram's investment = $\frac{3}{5}$ of ₹ 40, 000

It can be written as

= $\frac{3}{5} \times 40, 000$

By further calculation

= 3×8000

= ₹ 24, 000

Deepak's investment = $\frac{2}{5}$ of ₹ 40, 000

It can be written as

= $\frac{2}{5} \times 40, 000$

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By further calculation

$$= 2 \times 8000$$

$$= ₹ 16,000$$

7. Geeta had 30 problems for home work. She worked out $\frac{2}{3}$ of them. How many problems were still left to be worked out by her?

Solution:

Number of problems Geeta had for home work = 30

Number of problems worked out by Geeta = $\frac{2}{3}$ of 30

We can write it as

$$= \frac{2}{3} \times 30$$

$$= 20$$

Number of problems still left to be worked out by her = $30 - 20 = 10$

8. A picture was marked at ₹ 90. It was sold at $\frac{3}{4}$ of its marked price. What was the sale price?

Solution:

It is given that

Marked price of picture = ₹ 90

Sale price of picture = $\frac{3}{4}$ of ₹ 90

We can write it as

$$= \frac{3}{4} \times 90$$

$$= ₹ 270/4$$

$$= ₹ 67 \frac{1}{2}$$

$$= ₹ 67.50$$

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9. Mani had sent fifteen parcels of oranges. What was the total weight of the parcels, if each weighed $10 \frac{1}{2}$ kg?

Solution:

Number of parcels = 15

Weight of each parcel = $10 \frac{1}{2}$ kg = $21/2$ kg

So the total weight of parcels = 15 of $21/2$ kg

We can write it as

$$= 21/2 \times 15 \text{ kg}$$

By further calculation

$$= 315/2$$

$$= 157 \frac{1}{2} \text{ kg}$$

$$= 157.5 \text{ kg}$$

10. A rope is $25 \frac{1}{2}$ m long. How many pieces each of $1 \frac{1}{2}$ m length can be cut out from it?

Solution:

Length of rope = $25 \frac{1}{2}$ m = $51/2$ m

Length of each piece = $1 \frac{1}{2}$ m = $3/2$ m

So the number of pieces = $51/2 \div 3/2$

We can write it as

$$= 51/2 \times 2/3$$

$$= 17 \text{ pieces}$$

11. The heights of two vertical poles, above the earth's surface, are $14 \frac{1}{4}$ m and $22 \frac{1}{3}$ m respectively. How much higher is the second pole as compared with the height of the first pole?

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Solution:

It is given that

Height of first pole above the earth's surface = $14 \frac{1}{4}$ m

Height of second pole above the earth's surface = $22 \frac{1}{3}$ m

So height of second pole when compared to first pole = $22 \frac{1}{3} - 14 \frac{1}{4}$

We can write it as

$$= \frac{67}{3} - \frac{57}{4}$$

LCM of 3 and 4 is 12

$$= \frac{(268 - 171)}{12}$$

By further calculation

$$= \frac{97}{12} \text{ m}$$

$$= 8 \frac{1}{12} \text{ m}$$

12. Vijay weighed $65 \frac{1}{2}$ kg. He gained $1 \frac{2}{5}$ kg during the first week, $1 \frac{1}{4}$ kg during the second week, but lost $\frac{5}{16}$ kg during the third week. What was his weight after the third week?

Solution:

It is given that

Weight of Vijay = $65 \frac{1}{2}$ kg

Weight gained during first week = $1 \frac{2}{5}$ kg

Weight gained during second week = $1 \frac{1}{4}$ kg

Weight lost during third week = $\frac{5}{16}$ kg

So the weight of Vijay after third week = $65 \frac{1}{2} + 1 \frac{2}{5} + 1 \frac{1}{4} - \frac{5}{16}$

It can be written as

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$$= 13\frac{1}{2} + 7\frac{1}{5} + 5\frac{1}{4} - 5\frac{1}{16}$$

LCM of 2, 5, 4 and 16 is 80

$$= (5240 + 112 + 100 - 25) / 80$$

By further calculation

$$= (5452 - 25) / 80$$

$$= 5427 / 80 \text{ kg}$$

$$= 67\frac{67}{80} \text{ kg}$$

13. A man spends $\frac{2}{5}$ of his salary on food and $\frac{3}{10}$ on house rent, electricity, etc. What fraction of his salary is still left with him?

Solution:

Consider salary of man = ₹ 1

Salary spent on food = $\frac{2}{5}$ of ₹ 1 = ₹ $\frac{2}{5}$

Salary spent on house rent = $\frac{3}{10}$ of ₹ 1 = ₹ $\frac{3}{10}$

So the total salary spent = $\frac{2}{5} + \frac{3}{10}$

LCM of 5 and 10 is 10

$$= (4 + 3) / 10$$

$$= 7 / 10$$

Salary still left with him = $1 - 7 / 10$

LCM of 1 and 10 is 10

$$= (10 - 7) / 10$$

$$= 3 / 10$$

14. A man spends $\frac{2}{5}$ of his salary on food and $\frac{3}{10}$ of the remaining on house rent, electricity, etc. What fraction of his salary is still left with him?

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Solution:

Consider ₹ 1 as the total salary

Salary spent on food = $\frac{2}{5}$ of ₹ 1 = ₹ $\frac{2}{5}$

So the remaining salary = $1 - \frac{2}{5}$

It can be written as

$$= \frac{(5 - 2)}{5}$$

$$= ₹ \frac{3}{5}$$

Salary spent on house rent = $\frac{3}{10}$ of $\frac{3}{5}$ = ₹ $\frac{9}{50}$

So the remaining salary = $\frac{3}{5} - \frac{9}{50}$

LCM of 5 and 50 is 50

$$= \frac{(30 - 9)}{50}$$

$$= ₹ \frac{21}{50}$$

15. Shyam bought a refrigerator for ₹ 5,000. He paid $\frac{1}{10}$ of the price in cash and the rest in 12 equal monthly instalments. How much had he to pay each month?

Solution:

Total cost of refrigerator = ₹ 5000

Cash paid = $\frac{1}{10}$ of ₹ 5000

$$= \frac{1}{10} \times 5000$$

$$= ₹ 500$$

So the balance amount = $5000 - 500 = ₹ 4500$

Number of instalments = 12

So the amount to be paid each month = $4500 \div 12$

We can write it as

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$$= 4500 \times \frac{1}{12}$$

$$= ₹ 375$$



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- [Chapter 5- Exponents \(Including Laws of Exponents\)](#)
- [Chapter 6- Ratio and Proportion \(Including Sharing in a Ratio\)](#)
- [Chapter 7- Unitary Method \(Including Time and Work\)](#)
- [Chapter 8- Percent and Percentage](#)
- [Chapter 9- Profit, Loss and Discount](#)
- [Chapter 10- Simple Interest](#)
- [Chapter 11- Fundamental Concepts \(Including Fundamental Operations\)](#)
- [Chapter 12- Simple Linear Equations \(Including Word Problems\)](#)
- [Chapter 13- Set Concepts](#)
- [Chapter 14- Lines and Angles \(Including Construction of Angles\)](#)
- [Chapter 15- Triangles](#)
- [Chapter 16- Pythagoras Theorem](#)
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