Fractions
Exercise 2A

Solution 01

Answer :

We have the following:

(i) 58 and 712

By cross multiplication, we get:
5 × 12 = 60 and 7 × 8 = 56
However, 60 > 56
∴ 58>712

(ii) 59and1115
By cross multiplication, we get:
5 × 15 = 75 and 9 × 11 = 99
However, 75 < 99
∴ 59<1115

(iii) 1112and1516
By cross multiplication, we get:
11 × 16 = 176 and 12 × 15 = 180
However, 176 < 180
∴ 1112<1516

Answer :

(i) The given fractions are $\frac{3}{4}, \frac{5}{6}, \frac{7}{9}$ and $\frac{11}{12}$.

LCM of 4, 6, 9 and 12 = 36

Now, let us change each of the given fractions into an equivalent fraction with 72 as its denominator.

$\frac{3}{4} = \frac{3\times9}{4\times9} = \frac{27}{36}$

$\frac{5}{6} = \frac{5\times6}{6\times6} = \frac{30}{36}$

$\frac{7}{9} = \frac{7\times4}{9\times4} = \frac{28}{36}$

$\frac{11}{12} = \frac{11\times3}{12\times3} = \frac{33}{36}$

Clearly, $\frac{27}{36} < \frac{28}{36} < \frac{30}{36} < \frac{33}{36}$

Hence, $\frac{3}{4} < \frac{7}{9} < \frac{5}{6} < \frac{11}{12}$

∴ The given fractions in ascending order are $\frac{3}{4}, \frac{7}{9}, \frac{5}{6}$ and $\frac{11}{12}$.

(ii) The given fractions are: $\frac{4}{5}$, $\frac{7}{10}$, $\frac{11}{15}$ and $\frac{17}{20}$.

LCM of 5, 10, 15 and 20 = 60

Now, let us change each of the given fractions into an equivalent fraction with 60 as its denominator.

$\frac{4}{5} = \frac{4\times12}{5\times12} = \frac{48}{60}$

$\frac{7}{10} = \frac{7\times6}{10\times6} = \frac{42}{60}$

$\frac{11}{15} = \frac{11\times4}{15\times4} = \frac{44}{60}$

$\frac{17}{20} = \frac{17\times3}{20\times3} = \frac{51}{60}$

Clearly, $\frac{42}{60} < \frac{44}{60} < \frac{48}{60} < \frac{51}{60}$

Hence, $\frac{7}{10} < \frac{11}{15} < \frac{4}{5} < \frac{17}{20}$

∴ The given fractions in ascending order are $\frac{7}{10}$, $\frac{11}{15}$, $\frac{4}{5}$ and $\frac{17}{20}$

Solution 03

Answer :

We have the following:
(i) The given fractions are $\frac{3}{4}$, $\frac{7}{8}$, $\frac{7}{12}$ and $\frac{17}{24}$.

LCM of 4,8,12 and 24 = 24

Now, let us change each of the given fractions into an equivalent fraction with 24 as its denominator.
$\frac{3}{4} = \frac{3\times6}{4\times6} = \frac{18}{24}$

$\frac{7}{8} = \frac{7\times3}{8\times3} = \frac{21}{24}$

$\frac{7}{12} = \frac{7\times2}{12\times2} = \frac{14}{24}$

$\frac{17}{24} = \frac{17\times1}{24\times1} = \frac{17}{24}$

Clearly, $\frac{21}{24} > \frac{18}{24} > \frac{17}{24} > \frac{14}{24}$

Hence, $\frac{7}{8} > \frac{3}{4} > \frac{17}{24} > \frac{7}{12}$

∴ The given fractions in descending order are $\frac{7}{8}$, $\frac{3}{4}$, $\frac{17}{24}$ and $\frac{7}{12}$.

(ii) The given fractions are $\frac{2}{3}$, $\frac{3}{5}$, $\frac{7}{10}$ and $\frac{8}{15}$.

LCM of 3,5,10 and 15 = 30

Now, let us change each of the given fractions into an equivalent fraction with 30 as its denominator.

$\frac{2}{3} = \frac{2\times10}{3\times10} = \frac{20}{30}$

$\frac{3}{5} = \frac{3\times6}{5\times6} = \frac{18}{30}$

$\frac{7}{10} = \frac{7\times3}{10\times3} = \frac{21}{30}$

$\frac{8}{15} = \frac{8\times2}{15\times2} = \frac{16}{30}$

Clearly, $\frac{21}{30} > \frac{20}{30} > \frac{18}{30} > \frac{16}{30}$

Hence, $\frac{7}{10} > \frac{2}{3} > \frac{3}{5} > \frac{8}{15}$

∴ The given fractions in descending order are $\frac{7}{10}$, $\frac{2}{3}$, $\frac{3}{5}$ and $\frac{8}{15}$.

Solution 04

Answer :

We will compare the given fractions $\frac{2}{7}$ and $\frac{4}{5}$ in order to know who got the larger part of the apple.

We have,

By cross multiplication, we get:

2 × 5 = 10 and 4 × 7 = 28

However, 10 < 28

∴ $\frac{2}{7} < \frac{4}{5}$

Thus, Sonal got the larger part of the apple.

Now, $\frac{4}{5} - \frac{2}{7} = \frac{28-10}{35} = \frac{18}{35}$

∴ Sonal got $\frac{18}{35}$ part of the apple more than Reenu.

Solution 05

Answer :

(i) $\frac{5}{9} + \frac{3}{9} = \frac{8}{9}$

(ii) $\frac{8}{9} + \frac{7}{12}$

$= \frac{32}{36} + \frac{21}{36}$ [∵ LCM of 9 and 12 = 36]

$= \frac{32+21}{36}$

$= \frac{53}{36} = 1\frac{17}{36}$

(iii) $\frac{5}{6} + \frac{7}{8}$

$= \frac{20}{24} + \frac{21}{24}$ [∵ LCM of 6 and 8 = 24]

$= \frac{20+21}{24}$

$= \frac{41}{24} = 1\frac{17}{24}$

(iv) $\frac{7}{12} + \frac{11}{16} + \frac{9}{24}$

$\frac{28}{48} + \frac{33}{48} + \frac{18}{48}$ [∵ LCM of 12, 16 and 24 = 48]

$= \frac{28+33+18}{48}$

$= \frac{79}{48} = 1\frac{31}{48}$

(v) $3\frac{4}{5}+2\frac{3}{10}+1\frac{1}{15}$

$=\frac{19}{5}+\frac{23}{10}+\frac{16}{15}$

$=\frac{114}{30}+\frac{69}{30}+\frac{32}{30}$ [∵ LCM of 5, 10 and 15 = 30]

$=\frac{114+69+32}{30}$

$=\frac{215}{30}=7\frac{5}{30}=7\frac{1}{6}$

(vi) $8\frac{3}{4}+10\frac{2}{5}$

$=\frac{35}{4}+\frac{52}{5}$

$=\frac{175}{20}+\frac{208}{20}$ [∵ LCM of 4 and 5 = 20]

$=\frac{175+208}{20}$

$=\frac{383}{20}=19\frac{3}{20}$

Solution 06

Answer :

(i) $\frac{5}{7}-\frac{2}{7}=\frac{5-2}{7}=\frac{3}{7}$

(ii) $\frac{5}{6}-\frac{3}{4}$

$=\frac{10}{12}-\frac{9}{12}$ [∵ LCM of 6 and 4 = 12]

$=\frac{10-9}{12}$

$=\frac{1}{12}$

(iii) $3\frac{1}{5}-\frac{7}{10}$

$=\frac{16}{5}-\frac{7}{10}$

$=\frac{32}{10}-\frac{7}{10}$ [∵ LCM of 5 and 10 = 10]

$=\frac{32-7}{10}$

$=\frac{25}{10}=\frac{5}{2}=2\frac{1}{2}$

(iv) $7-4\frac{2}{3}$

$=\frac{7}{1}-\frac{14}{3}$

$=\frac{21-14}{3}$ [∵ LCM of 1 and 3 = 3]

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

(v) $3\frac{3}{10} - 1\frac{7}{15}$

$= \frac{33}{10} - \frac{22}{15}$

$= \frac{99-44}{30}$ [∵ LCM of 10 and 15 = 30]

$= \frac{55}{30} = \frac{11}{6} = 1\frac{5}{6}$

(vi) $2\frac{5}{9} - 1\frac{7}{15}$

$= \frac{23}{9} - \frac{22}{15}$

$= \frac{115-66}{45}$ [∵ LCM of 9 and 15 = 45]

$= \frac{49}{45} = 1\frac{4}{45}$

Solution 07

Answer :

(i) $\frac{2}{3} + \frac{5}{6} - \frac{1}{9}$

$= \frac{12+15-2}{18}$ [∵ LCM of 3, 6 and 9 = 18]

$= \frac{27-2}{18} = \frac{25}{18} = 1\frac{7}{18}$

(ii) $8 - 4\frac{1}{2} - 2\frac{1}{4}$

$= \frac{8}{1} - \frac{9}{2} - \frac{9}{4}$

$= \frac{32-18-9}{4}$ [∵ LCM of 1, 2 and 4 = 4]

$= \frac{32-27}{4} = \frac{5}{4} = 1\frac{1}{4}$

(iii) $8\frac{5}{6} - 3\frac{3}{8} + 1\frac{7}{12}$

$= \frac{53}{6} - \frac{27}{8} + \frac{19}{12}$

$= \frac{212-81+38}{24}$ [∵ LCM of 6, 8 and 12 = 24]

$= \frac{250-81}{24} = \frac{169}{24} = 7\frac{1}{24}$

Solution 08

Answer :

Total weight of fruits bought by Aneeta = $\left(3\frac{3}{4} + 4\frac{1}{2}\right)$ kg

Now, we have:

$3\frac{3}{4} + 4\frac{1}{2} = \frac{15}{4} + \frac{9}{2}$

$= \frac{15+18}{4}$ [∵ LCM of 2 and 4 = 4]

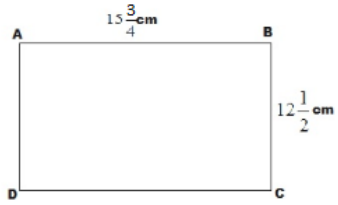
$= \frac{15+18}{4} = \frac{33}{4} = 8\frac{1}{4}$

Hence, the total weight of the fruits purchased by Aneeta is $8\frac{1}{4}$ kg.

Solution 09

Answer :

We have:



Perimeter of the rectangle ABCD = AB + BC + CD +DA

$= \left(15\frac{3}{4} + 12\frac{1}{2} + 15\frac{3}{4} + 12\frac{1}{2}\right)$ cm

$= \left(\frac{63}{4} + \frac{25}{2} + \frac{63}{4} + \frac{25}{2}\right)$ cm

$= \left(\frac{63+50+63+50}{4}\right)$ cm [∵ LCM of 2 and 4 = 4]

$= \left(\frac{226}{4}\right)$ cm $= \left(\frac{113}{2}\right)$ cm $= 56\frac{1}{2}$ cm

Hence, the perimeter of ABCD is $56\frac{1}{2}$ cm.

Solution 10

Answer :

Actual width of the picture = $7\frac{3}{5}$ cm $= \frac{38}{5}$ cm

Required width of the picture = $7\frac{3}{10}$ cm $= \frac{73}{10}$ cm

∴ Extra width = $\left(\frac{38}{5} - \frac{73}{10}\right)$ cm

$= \left(\frac{76-73}{10}\right)$ cm [∵ LCM of 5 and 10 is 10]

$= \frac{3}{10}$ cm

Hence, the width of the picture should be trimmed by $\frac{3}{10}$ cm.

Solution 11

Answer :

Required number to be added = $18 - 7\frac{3}{5}$

$= \frac{18}{1} - \frac{38}{5}$

$= \frac{90-38}{5}$ [∵ LCM of 1 and 5 = 5]

$= \frac{52}{5} = 10\frac{2}{5}$

Hence, the required number is $10\frac{2}{5}$.

Solution 12

Answer :

Required number to be added = $8\frac{2}{5} - 7\frac{4}{15}$

$= \frac{42}{5} - \frac{109}{15}$

$= \frac{126-109}{15}$ [∵ LCM of 5 and 15 = 15]

$= \frac{17}{15} = 1\frac{2}{15}$

Hence, the required number should be $1\frac{2}{15}$.

Solution 13

Answer :

Required length of other piece of wire = $\left(3\frac{3}{4}-1\frac{1}{2}\right)\text{m}$

$$=\left(\frac{15}{4}-\frac{3}{2}\right)\text{m}$$

$$=\left(\frac{15-6}{4}\right)\text{m} \quad [\because \text{LCM of 4 and 2} = 4]$$

$$=\frac{9}{4}\text{m}=2\frac{1}{4}\text{m}$$

Hence, the length of the other piece of wire is $2\frac{1}{4}\text{m}$.

Solution 14

Answer :

Actual duration of the film = $\left(3\frac{2}{3}-1\frac{1}{2}\right)\text{hours}$

$$=\left(\frac{11}{3}-\frac{3}{2}\right)\text{hours}$$

$$=\left(\frac{22-9}{6}\right)\text{hours} \quad [\because \text{LCM of 3 and 2} = 6]$$

$$=\frac{13}{6}\text{hours}=2\frac{1}{6}\text{hours}$$

Hence, the actual duration of the film was $2\frac{1}{6}\text{hours}$.

Solution 15

Answer :

First we have to compare the fractions: $\frac{2}{3}$ and $\frac{5}{9}$.
By cross multiplication, we have:
$2 \times 9 = 18$ and $5 \times 3 = 15$

However, $18 > 15$
$\therefore \frac{2}{3} > \frac{5}{9}$

So, $\frac{2}{3}$ is larger than $\frac{5}{9}$.
Now, $\frac{2}{3}-\frac{5}{9}$

$= \frac{6-5}{9}$ [$\because$ LCM of 3 and 9 = 9]
$=\frac{1}{9}$
Hence, $\frac{2}{3}$ is $\frac{1}{9}$ part more than $\frac{5}{9}$.

Solution 16

Answer :

First, we have to compare the cost of the pen and the pencil.
Cost of the pen = Rs $16\frac{3}{5}$ = Rs $\frac{83}{5}$

Cost of the pencil = Rs $4\frac{3}{4}$ = Rs $\frac{19}{4}$
Now, we have to compare fractions $\frac{83}{5}$ and $\frac{19}{4}$.
By cross multiplication, we get:

83 × 4 = 332 and 19 × 5 = 95

However, 332 > 95

$\therefore \frac{83}{5} > \frac{19}{4}$

So, the cost of pen is more than that of the pencil.
Now, Rs $\left(\frac{83}{5} - \frac{19}{4}\right)$

= Rs $\left(\frac{332-95}{20}\right)$ [$\because$ LCM of 4 and 5 = 20]

= Rs $\frac{237}{20}$ = Rs $11\frac{17}{20}$

$\therefore$ The pen costs Rs $11\frac{17}{20}$ more than the pencil.

Fractions
Exercise 2B

solution 01

Answer :

(i) $\frac{3}{5} \times \frac{7}{11} = \frac{3\times7}{5\times11} = \frac{21}{55}$

(ii) $\frac{5}{8} \times \frac{4}{7} = \frac{5\times4}{8\times7} = \frac{5\times1}{2\times7} = \frac{5}{14}$

(iii) $\frac{4}{9} \times \frac{15}{16} = \frac{4\times15}{9\times16} = \frac{1\times5}{3\times4} = \frac{5}{12}$

(iv) $\frac{2}{5} \times 15 = \frac{2}{5} \times \frac{15}{1} = \frac{2\times15}{5\times1} = \frac{2\times3}{1\times1} = 6$

(v) $\frac{8}{15} \times 20 = \frac{8}{15} \times \frac{20}{1} = \frac{8\times20}{15\times1} = \frac{8\times4}{3\times1} = \frac{32}{3} = 10\frac{2}{3}$

(vi) $\frac{5}{8} \times 1000 = \frac{5}{8} \times \frac{1000}{1} = \frac{5\times1000}{8\times1} = \frac{5\times125}{1\times1} = 625$

(vii) $3\frac{1}{8} \times 16 = \frac{25}{8} \times \frac{16}{1} = \frac{25\times16}{8\times1} = \frac{25\times2}{1\times1} = 50$

(viii) $2\frac{4}{15} \times 12 = \frac{34}{15} \times \frac{12}{1} = \frac{34\times12}{15\times1} = \frac{34\times4}{5\times1} = \frac{136}{5} = 27\frac{1}{5}$

(ix) $3\frac{6}{7} \times 4\frac{2}{3} = \frac{27}{7} \times \frac{14}{3} = \frac{27\times14}{7\times3} = \frac{9\times2}{1\times1} = 18$

(x) $9\frac{1}{2} \times 1\frac{9}{19} = \frac{19}{2} \times \frac{28}{19} = \frac{19\times28}{2\times19} = \frac{1\times14}{1\times1} = 14$

(xi) $4\frac{1}{8} \times 2\frac{10}{11} = \frac{33}{8} \times \frac{32}{11} = \frac{33\times32}{8\times11} = \frac{3\times4}{1\times1} = 12$

(xii) $5\frac{5}{6} \times 1\frac{5}{7} = \frac{35}{6} \times \frac{12}{7} = \frac{35\times12}{6\times7} = \frac{5\times2}{1\times1} = 10$

solution 02

Answer :

We have the following:

(i) $\frac{2}{3} \times \frac{5}{44} \times \frac{33}{35} = \frac{2\times5\times33}{3\times44\times35} = \frac{1\times1\times11}{1\times22\times7} = \frac{1\times1\times1}{1\times2\times7} = \frac{1}{14}$

(ii) $\frac{12}{25} \times \frac{15}{28} \times \frac{35}{36} = \frac{1\times3\times5}{5\times4\times3} = \frac{1\times1\times1}{1\times4\times1} = \frac{1}{4}$

(iii) $\frac{10}{27} \times \frac{28}{65} \times \frac{39}{56} = \frac{10\times1\times3}{27\times5\times2} = \frac{1\times1\times3}{27\times1\times1} = \frac{3}{27} = \frac{1}{9}$

(iv) $1\frac{4}{7} \times 1\frac{13}{22} \times 1\frac{1}{15}$

$= \frac{11}{7} \times \frac{35}{22} \times \frac{16}{15} = \frac{11\times35\times16}{7\times22\times15} = \frac{1\times5\times16}{1\times2\times15} = \frac{1\times1\times8}{1\times1\times3} = \frac{8}{3} = 2\frac{2}{3}$

(v) $2\frac{2}{17} \times 7\frac{2}{9} \times 1\frac{33}{52}$

$= \frac{36}{17} \times \frac{65}{9} \times \frac{85}{52} = \frac{36\times65\times85}{17\times9\times52} = \frac{4\times5\times5}{1\times1\times4} = \frac{1\times5\times5}{1\times1\times1} = 25$

(vi) $3\frac{1}{16} \times 7\frac{3}{7} \times 1\frac{25}{39}$

$= \frac{49}{16} \times \frac{52}{7} \times \frac{64}{39} = \frac{7\times4\times4}{1\times1\times3} = \frac{112}{3} = 37\frac{1}{3}$

solution 03

Answer :

We have the following:

(i) $\frac{1}{3}$ of 24 = $24 \times \frac{1}{3} = \frac{24}{1} \times \frac{1}{3} = \frac{24\times1}{1\times3} = 8$

(ii) $\frac{3}{4}$ of 32 = $32 \times \frac{3}{4} = \frac{32}{1} \times \frac{3}{4} = \frac{32\times3}{1\times4} = \frac{8\times3}{1\times1} = 24$

(iii) $\frac{5}{9}$ of 45 = $45 \times \frac{5}{9} = \frac{45}{1} \times \frac{5}{9} = \frac{45\times5}{1\times9} = \frac{5\times5}{1\times1} = 25$

(iv) $\frac{7}{50}$ of 1000 = $1000 \times \frac{7}{50} = \frac{1000}{1} \times \frac{7}{50} = \frac{20\times7}{1\times1} = 140$

(v) $\frac{3}{20}$ of 1020 = $1020 \times \frac{3}{20} = \frac{1020}{1} \times \frac{3}{20} = \frac{51\times3}{1\times1} = 153$

(vi) $\frac{5}{11}$ of Rs 220 = Rs $\left(220 \times \frac{5}{11}\right)$ = Rs (20 × 5) = Rs 100

(vii) $\frac{4}{9}$of 54 m = $\left(\frac{4}{9} \times 54\right)$m = (4 × 6) m = 24 m

(viii) $\frac{6}{7}$ of 35 L = $\left(\frac{6}{7} \times 35\right)$L = (6 × 5) L = 30 L

(ix) $\frac{1}{6}$ of 1 h = $\frac{1}{6}$ of 60 min = $\left(60 \times \frac{1}{6}\right)$ min = 10 min

(x) $\frac{5}{6}$ of an year = $\frac{5}{6}$ of 12 months = $\left(12 \times \frac{5}{6}\right)$ months = (2 × 5) months = 10 months

(xi) $\frac{7}{20}$ of a kg = $\frac{7}{20}$ of 1000 g = $\left(1000 \times \frac{7}{20}\right)$ g = (50 × 7) gm = 350 g

(xii) $\frac{9}{20}$ of 1 m = $\frac{9}{20}$ of 100 cm = $\left(100 \times \frac{9}{20}\right)$ cm = (5 × 9) cm = 45 cm

(xiii) $\frac{7}{8}$ of a day = $\frac{7}{8}$ of 24 h = $\left(24 \times \frac{7}{8}\right)$ h = (3 × 7) = 21 h

(xiv) $\frac{3}{7}$ of a week = $\frac{3}{7}$ of 7 days = $\left(7 \times \frac{3}{7}\right)$ days = 3 days

(xv) $\frac{7}{50}$ of 1 L = $\frac{7}{50}$ of 1000 ml = $\left(1000 \times \frac{7}{50}\right)$ ml = (20 × 7) ml = 140 ml

solution 04

Answer :

Cost of 1kg of apples = $\text{Rs } 18\frac{2}{5} = \text{Rs } \frac{92}{5}$

$\therefore$ Cost of $3\frac{3}{4}$ kg of apples = $\text{Rs } \left(\frac{92}{5} \times 3\frac{3}{4}\right)$

$= \text{Rs } \left(\frac{92}{5} \times \frac{15}{4}\right) = \text{Rs } \left(\frac{23 \times 3}{1 \times 1}\right) = \text{Rs } 69$

Hence, the cost of $3\frac{3}{4}$ kg of apples is Rs 69.

solution 05

Answer :

Cost of 1 m of cloth = $\text{Rs } 42\frac{1}{2} = \text{Rs } \frac{85}{2}$

$\therefore$ Cost of $5\frac{3}{5}$ m of cloth = Rs $\left(\frac{85}{2} \times 5\frac{3}{5}\right)$

$= \text{Rs } \left(\frac{85}{2} \times \frac{28}{5}\right) = \text{Rs } \left(\frac{85 \times 28}{2 \times 5}\right) = \text{Rs } (17 \times 14) = \text{Rs } 238$

Hence, the cost of $5\frac{3}{5}$ m of cloth is Rs 238.

solution 06

Answer :

Distance covered by the car in 1 h = $66\frac{2}{3}$ km

Distance covered by the car in 9 h = $\left(66\frac{2}{3} \times 9\right)$ km

$= \left(\frac{200}{3} \times 9\right) \text{km} = \left(\frac{200 \times 9}{3 \times 1}\right) \text{km} = (200 \times 3) \text{km} = 600 \text{ km}$

Hence, the distance covered by the car in 9 h will be 600 km.

solution 07

Answer :

Capacity of 1 tin = $12\frac{3}{4}\ \text{L} = \frac{51}{4}\ \text{L}$

$\therefore$ Capacity of 26 such tins = $\left(26 \times \frac{51}{4}\right) \text{L}$

$= \left(\frac{26}{1} \times \frac{51}{4}\right) \text{L} = \left(\frac{26 \times 51}{1 \times 4}\right) \text{L} = \left(\frac{13 \times 51}{1 \times 2}\right) \text{L} = \left(\frac{663}{2}\right) \text{L} = 331\frac{1}{2}\ \text{L}$

Hence, 26 such tins can hold $331\frac{1}{2}$ L of oil.

solution 08

Answer :

Cost of 1 ticket = Rs $35\frac{1}{2}$ = Rs $\frac{71}{2}$

$\therefore$ Cost of 308 tickets = Rs $\left(\frac{71}{2} \times 308\right) = \text{Rs } \left(\frac{71}{2} \times \frac{308}{1}\right) = \text{Rs } \left(71 \times 154\right) = \text{Rs } 10934$

Hence, 308 tickets were sold for Rs 10,934.

solution 09

Answer :

Thickness of 1 board = $3\frac{2}{3}$ cm

$\therefore$ Thickness of 9 boards = $\left(9 \times 3\frac{2}{3}\right)$ cm

$= \left(\frac{9}{1} \times \frac{11}{3}\right)$ cm = (3 × 11) cm = 33 cm

Hence, the height of the stack is 33 cm.

solution 10

Answer :

Time taken by Rohit to complete one round of the circular park = $4\frac{4}{5}$ min = $\frac{24}{5}$ min

$\therefore$ Time taken to complete 15 rounds = $\left(15 \times \frac{24}{5}\right)$ min

= (3 × 24) min

= 72 min

= 1 h 12 min [$\because$ 1 hr = 60 min]

Hence, Rohit will take 1 h 12 min to make 15 complete rounds of the circular park.

solution 11

Answer :

Weight of Amit = 35 kg

Weight of Kavita = $\frac{3}{5}$ of Amit's weight

= 35 kg x $\frac{3}{5}$ = $\left(35 \times \frac{3}{5}\right)\text{kg} = \left(7 \times 3\right)\text{ kg} = 21\text{ kg}$

Hence, Kavita's weight is 21 kg.

solution 12

Answer :

Number of boys in the class = $\frac{5}{7}$ of the total no. of students

$= \frac{5}{7} \times 42 = \left(\frac{5 \times 42}{7}\right) = 5 \times 6 = 30$

∴ Number of girls in the class = 42 − 30 = 12

Hence, there are 12 girls in the class.

solution 13

Answer :

Sapna's total monthly income = Rs 12000

Monthly expenditure = $\frac{7}{8}$ of Rs 12000

= Rs $\left(\frac{7}{8} \times 12000\right)$ = Rs (7 × 1500) = Rs 10500

∴ Monthly savings = Rs 12000 − Rs 10500

= Rs 1500

Hence, Sapna deposits Rs 1500 in the bank every month.

solution 14

Answer :

Side of the square field = $4\frac{2}{3}\text{ m}$

∴ Area of the square = $(\text{side})^2$

$= \left(4\frac{2}{3}\text{ m}\right)^2$

$= \left(\frac{14}{3}\text{ m}\right)^2 = \frac{14}{3}\text{ m} \times \frac{14}{3}\text{ m} = \left(\frac{14 \times 14}{3 \times 3}\right)\text{m}^2 = \frac{196}{9}\text{ m}^2 = 21\frac{7}{9}\text{ m}^2$

Hence, the area of the square field is $21\frac{7}{9}\text{ m}^2$.

Solution 15

Answer :

Length of the rectangular park = $41\frac{2}{3}\text{ m} = \frac{125}{3}\text{ m}$

Its breadth = $18\frac{3}{5}\text{ m} = \frac{93}{5}\text{ m}$

∴ Its area = length × breadth

$= \left(\frac{125}{3} \times \frac{93}{5}\right)\text{m}^2$

= (25 × 31) m = 775 m^2

Hence, the area of the rectangular park is 775 m^2.

Fractions
Exercise 2C

01

Answer :

(i) Reciprocal of $\frac{5}{8} = \frac{8}{5}$ $[\because \frac{5}{8} \times \frac{8}{5} = 1]$

(ii) Reciprocal of $7 = \frac{1}{7}$ $[\because 7 \times \frac{1}{7} = 1]$

(iii) Reciprocal of $\frac{1}{12} = 12$ $[\because \frac{1}{12} \times 12 = 1]$

(iv) Reciprocal of $12\frac{3}{5}$ = Reciprocal of $\frac{63}{5} = \frac{5}{63}$ $[\because \frac{63}{5} \times \frac{5}{63} = 1]$

02

Answer :

(i) $\frac{4}{7} \div \frac{9}{14} = \frac{4}{7} \times \frac{14}{9}$ [∵ Reciprocal of $\frac{9}{14} = \frac{14}{9}$]

$= \frac{8}{9}$

(ii) $\frac{7}{10} \div \frac{3}{5} = \frac{7}{10} \times \frac{5}{3}$ [∵ Reciprocal of $\frac{3}{5} = \frac{5}{3}$]

$= \frac{7}{6} = 1\frac{1}{6}$

(iii) $\frac{8}{9} \div 16 = \frac{8}{9} \times \frac{1}{16}$ [∵ Reciprocal of $16 = \frac{1}{16}$]

$= \frac{1}{18}$

(iv) $9 \div \frac{1}{3} = 9 \times 3$ [∵ Reciprocal of $\frac{1}{3}$ = 3]

= 27

(v) $24 \div \frac{6}{7} = 24 \times \frac{7}{6}$ [∵ Reciprocal of $\frac{6}{7} = \frac{7}{6}$]

= 4 × 7 = 28

(vi) $3\frac{3}{5} \div \frac{4}{5} = \frac{18}{5} \div \frac{4}{5}$

$= \frac{18}{5} \times \frac{5}{4}$ [∵ Reciprocal of $\frac{4}{5} = \frac{5}{4}$]

$= \frac{18}{4} = \frac{9}{2} = 4\frac{1}{2}$

(vii) $3\frac{3}{7} \div \frac{8}{21} = \frac{24}{7} \div \frac{8}{21}$

$= \frac{24}{7} \times \frac{21}{8}$ [∵ Reciprocal of $\frac{8}{21} = \frac{21}{8}$]

= 3 3 = 9

(viii) $5\frac{4}{7} \div 1\frac{3}{10} = \frac{39}{7} \div \frac{13}{10}$

$= \frac{39}{7} \times \frac{10}{13}$ [∵ Reciprocal of $\frac{13}{10} = \frac{10}{13}$]

$= \frac{30}{7} = 4\frac{2}{7}$

(ix) $15\frac{3}{7} \div 1\frac{23}{49} = \frac{108}{7} \div \frac{72}{49}$

$= \frac{108}{7} \times \frac{49}{72}$ [∵ Reciprocal of $\frac{72}{49} = \frac{49}{72}$]

$= \frac{9\times7}{1\times6} = \frac{3\times7}{1\times2} = \frac{21}{2} = 10\frac{1}{2}$

03

Answer :

(i) $\frac{11}{24} \div \frac{7}{8}$

$= \frac{11}{24} \times \frac{8}{7}$ [∵ Reciprocal of $\frac{7}{8} = \frac{8}{7}$]

$= \frac{11}{21}$

(ii) $6\frac{7}{8} \div \frac{11}{16} = \frac{55}{8} \div \frac{11}{16}$

$= \frac{55}{8} \times \frac{16}{11}$ [∵ Reciprocal of $\frac{11}{16} = \frac{16}{11}$]

= 5 × 2 = 10

(iii) $5\frac{5}{9} \div 3\frac{1}{3} = \frac{50}{9} \div \frac{10}{3}$

$= \frac{50}{9} \times \frac{3}{10}$ [∵ Reciprocal of $\frac{10}{3} = \frac{3}{10}$]

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

(iv) $32 \div 1\frac{3}{5} = 32 \div \frac{8}{5}$

$= 32 \times \frac{5}{8}$ [∵ Reciprocal of $\frac{8}{5} = \frac{5}{8}$]

$= 4 \times 5 = 20$

(v) $45 \div 1\frac{4}{5} = 45 \div \frac{9}{5}$

$= 45 \times \frac{5}{9}$ [∵ Reciprocal of $\frac{9}{5} = \frac{5}{9}$]

$= 5 \times 5 = 25$

(vi) $63 \div 2\frac{1}{4} = 63 \div \frac{9}{4}$

$= 63 \times \frac{4}{9}$ [∵ Reciprocal of $\frac{9}{4} = \frac{4}{9}$]

$= 7 \times 4 = 28$

04

Answer :

Length of the rope = $13\frac{1}{2}$ m $= \frac{27}{2}$ m

Number of equal pieces = 9

∴ Length of each piece = $\left(\frac{27}{2} \div 9\right)$ m

$= \left(\frac{27}{2} \times \frac{1}{9}\right)$ m [∵ Reciprocal of 9 = $\frac{1}{9}$]

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

Hence, the length of each piece of rope is $1\frac{1}{2}$ m.

05

Answer :

Weight of 18 boxes of nails = $49\frac{1}{2}$ kg = $\frac{99}{2}$ kg

∴ Weight of 1 box = $\left(\frac{99}{2} \div 18\right)$ kg

$= \left(\frac{99}{2} \times \frac{1}{18}\right)$ kg [∵ Reciprocal of 18 = $\frac{1}{18}$]

$= \left(\frac{99 \times 1}{2 \times 18}\right)$ kg $= \left(\frac{11 \times 1}{2 \times 2}\right)$ kg $= \frac{11}{4}$ kg $= 2\frac{3}{4}$ kg

Hence, the weight of each box is $2\frac{3}{4}$ kg.

06

Answer :

Cost of 1 orange = Rs $3\frac{3}{4}$ = Rs $\frac{15}{4}$

Total cost of the oranges sold by the man = Rs 210

∴ Required number of oranges = $\left(210 \div \frac{15}{4}\right)$

$= \left(210 \times \frac{4}{15}\right)$ [∵ Reciprocal of $\frac{15}{4} = \frac{4}{15}$]

$= (14 \times 4) = 56$

Hence, the man sold 56 oranges.

Answer :

Cost of 1 kg of mangoes = Rs $18\frac{1}{2}$ = Rs $\frac{37}{2}$

Total cost of the required mangoes = Rs $157\frac{1}{4}$ = Rs $\frac{629}{4}$

∴ Weight of the required mangoes = $\left(\frac{629}{4} \div \frac{37}{2}\right)$ kg

$= \left(\frac{629}{4} \times \frac{2}{37}\right)$ kg [∵ Reciprocal of $\frac{37}{2} = \frac{2}{37}$]

$= \left(\frac{17}{2}\right)$ kg $= 8\frac{1}{2}$ kg

Hence, the weight of the mangoes available for Rs $157\frac{1}{4}$ is $8\frac{1}{2}$ kg.

07

Answer :

Distance covered by Vikas in $7\frac{3}{4}$ h = $20\frac{2}{3}$ km

$\therefore$ Distance covered by him in 1 h = $\left(20\frac{2}{3} \div 7\frac{3}{4}\right)$ km

$= \left(\frac{62}{3} \div \frac{31}{4}\right)$ km

$= \left(\frac{62}{3} \times \frac{4}{31}\right)$ km

$= \left(\frac{2\times4}{3}\right)$ km $= \left(\frac{8}{3}\right)$ km $= 2\frac{2}{3}$ km

Hence, the distance covered by Vikas in 1 h is $2\frac{2}{3}$ km.

08

Answer :

Cost of $8\frac{1}{2}$ kg of sugar = Rs $148\frac{3}{4}$

$\therefore$ Cost of 1 kg of sugar = Rs $\left(148\frac{3}{4} \div 8\frac{1}{2}\right)$

= Rs $\left(\frac{595}{4} \div \frac{17}{2}\right)$

= Rs $\left(\frac{595}{4} \times \frac{2}{17}\right)$ = Rs $\left(\frac{35}{2}\right)$ = Rs $17\frac{1}{2}$

Hence, the cost of 1 kg of sugar is Rs $17\frac{1}{2}$.

09

10

Answer :

Cost of 1 notebook = Rs $7\frac{3}{4}$ = Rs $\frac{31}{4}$

$\therefore$ Number of notebooks purchased for Rs $69\frac{3}{4}$ = $\left(69\frac{3}{4} \div \frac{31}{4}\right)$

$= \left(\frac{279}{4} \div \frac{31}{4}\right)$

$= \left(\frac{279}{4} \times \frac{4}{31}\right)$ [$\because$ Reciprocal of $\frac{31}{4} = \frac{4}{13}$]

$= \left(\frac{279}{31}\right) = 9$

Hence, 9 notebooks can be purchased for Rs $69\frac{3}{4}$.

11

Answer :

Cost of 1 ticket = Rs $10\frac{1}{2}$ = Rs $\frac{21}{2}$

Total amount collected by the boy = Rs $283\frac{1}{2}$ = Rs $\frac{567}{2}$

$\therefore$ Number of tickets sold = $\left(\frac{567}{2} \div \frac{21}{2}\right)$

$= \left(\frac{567}{2} \times \frac{2}{21}\right)$ [$\because$ Reciprocal of $\frac{21}{2} = \frac{2}{21}$]

$= \frac{567}{21} = 27$

Hence, the boy sold 27 tickets of the charity show.

12

Answer :

Amount contributed by 1 student = Rs $61\frac{1}{2}$ = Rs $\frac{123}{2}$

Total amount collected = Rs $676\frac{1}{2}$ = Rs $\frac{1353}{2}$

$\therefore$ Number of students in the group = $\left(\frac{1353}{2} \div \frac{123}{2}\right)$

$= \left(\frac{1353}{2} \times \frac{2}{123}\right)$ [$\because$ Reciprocal of $\frac{123}{2} = \frac{2}{123}$]

$= \left(\frac{1353}{123}\right) = 11$

Hence, there are 11 students in the group.

13

Answer :

Quantity of milk given to each student $= \frac{2}{5}$ L

Total quantity of milk distributed among all the students = 24 L

$\therefore$ Number of students $= \left(24 \div \frac{2}{5}\right)$

$= \left(24 \times \frac{5}{2}\right)$ [$\because$ Reciprocal of $\frac{2}{5} = \frac{5}{2}$]

$= (12 \times 5) = 60$

Hence, there are 60 students in the hostel.

14

Answer :

Capacity of the small jug $= \frac{3}{4}$ L

Capacity of the bucket $= 20\frac{1}{4}$ L $= \frac{81}{4}$ L

$\therefore$ Required number of small jugs $= \left(\frac{81}{4} \div \frac{3}{4}\right)$

$= \left(\frac{81}{4} \times \frac{4}{3}\right)$ [$\because$ Reciprocal of $\frac{3}{4} = \frac{4}{3}$]

$= \left(\frac{81}{3}\right) = 27$

Hence, the small jug has to be filled 27 times to empty the water from the bucket.

15

Answer :

Product of the two numbers $= 15\frac{5}{6} = \frac{95}{6}$

One of the numbers $= 6\frac{1}{3} = \frac{19}{3}$

$\therefore$ The other number $= \left(\frac{95}{6} \div \frac{19}{3}\right)$

$= \left(\frac{95}{6} \times \frac{3}{19}\right)$ [$\because$ Reciprocal of $\frac{19}{3} = \frac{3}{19}$]

$= \left(\frac{5}{2}\right) = 2\frac{1}{2}$

Hence, the other number is $2\frac{1}{2}$.

16

Answer :

Product of the two numbers = 42

One of the numbers $= 9\frac{4}{5} = \frac{49}{5}$

$\therefore$ The other number $= \left(42 \div \frac{49}{5}\right)$

$= \left(42 \times \frac{5}{49}\right)$ [$\because$ Reciprocal of $\frac{49}{5} = \frac{5}{49}$]

$= \left(\frac{6 \times 5}{7}\right) = \frac{30}{7} = 4\frac{2}{7}$

Hence, the required number is $4\frac{2}{7}$.

17

Answer :

Required number $= \left(6\frac{2}{9} \div 4\frac{2}{3}\right)$

$= \left(\frac{56}{9} \div \frac{14}{3}\right)$

$= \left(\frac{56}{9} \times \frac{3}{14}\right)$ [$\because$ Reciprocal of $\frac{14}{3} = \frac{3}{14}$]

$= \left(\frac{4}{3}\right) = 1\frac{1}{3}$

Hence, we have to divide $6\frac{2}{9}$ by $1\frac{1}{3}$ to get $4\frac{2}{3}$.

Fractions
Exercise 2D

Q1

Answer :

(c) $\frac{10}{3}$

$\frac{10}{3}$ is a vulgar fraction, because its denominator is other than 10, 100, 1000, etc.

Q2

Answer :

(c) $\frac{9}{7}$

$\frac{9}{7}$ is an improper fraction, because its numerator is greater than its denominator.

Q3

Answer :

(a) $\frac{105}{112}$

A fraction that is reducible can be reduced by dividing both the numerator and denominator by a common factor.

$\frac{105 \div 7}{112 \div 7} = \frac{15}{16}$

Thus, $\frac{105}{112}$ is a reducible fraction.

Q5

Answer :

(c) equivalent fractions

Equivalent fractions are those which are the same but look different.

Thus, $\frac{2}{3}$, $\frac{4}{6} = \frac{2}{3}$, $\frac{6}{9} = \frac{2}{3}$, $\frac{8}{12} = \frac{2}{3}$ are equivalent fractions.

Q5

Answer :

(c) $\frac{9}{16} > \frac{13}{24}$

The two fraction are $\frac{9}{16}$ and $\frac{13}{24}$.

By cross multiplication, we have:

$9 \times 24 = 216$ and $13 \times 16 = 208$

However, $216 > 208$

$\therefore \frac{9}{16} > \frac{13}{24}$

Q6

Answer :

(d) none of these

Reciprocal of $1\frac{3}{4}$ = Reciprocal of $\frac{7}{4} = \frac{4}{7}$

Q7

Answer :

(c) $\frac{5}{6}$

$\left(\frac{3}{10}+\frac{8}{15}\right)=\left(\frac{9+16}{30}\right)$ [∵ LCM of 10 and 15 = 30]

$=\frac{25}{30}=\frac{5}{6}$

Q8

Answer :

(d) $\frac{11}{12}$

$\left(3\frac{1}{4}-2\frac{1}{3}\right)=\left(\frac{13}{4}-\frac{7}{3}\right)$

$=\left(\frac{39-28}{12}\right)$ [∵ LCM of 4 and 3 = 12]

$=\frac{11}{12}$

Q9

Answer :

(d) 144

$36\div\frac{1}{4}=36\times 4$ [∵ Reciprocal of $\frac{1}{4}$= 4]

= 144

Q10

Answer :

(b) $\frac{5}{7}$

Required number = $1\frac{6}{7}\div 2\frac{3}{5}$

$=\frac{13}{7}\div\frac{13}{5}$

$=\frac{13}{7}\times\frac{5}{13}$ [∵ Reciprocal of $\frac{13}{5}=\frac{5}{13}$]

$=\frac{5}{7}$

Q11

Answer :

(d) $2\frac{1}{4}$

Required number = $1\frac{1}{2} \div \frac{2}{3}$

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

$= \frac{3}{2} \times \frac{3}{2}$ [∵ Reciprocal of $\frac{2}{3} = \frac{3}{2}$]

$= \frac{9}{4} = 2\frac{1}{4}$

Q12

Answer :

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

$1\frac{3}{5} \div \frac{2}{3} = \frac{8}{5} \div \frac{2}{3}$

$= \frac{8}{5} \times \frac{3}{2}$ [∵ Reciprocal of $\frac{2}{3} = \frac{3}{2}$]

$= \left(\frac{4\times3}{5}\right) = \frac{12}{5} = 2\frac{2}{5}$

Q13

Answer :

(d) $1\frac{5}{6}$

$2\frac{1}{5} \div 1\frac{1}{5} = \frac{11}{5} \div \frac{6}{5}$

$= \frac{11}{5} \times \frac{5}{6}$ [∵ Reciprocal of $\frac{6}{5} = \frac{5}{6}$]

$= \frac{11}{6} = 1\frac{5}{6}$

Q14

Answer :

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

Reciprocal of $1\frac{2}{3}$ = Reciprocal of $\frac{5}{3} = \frac{3}{5}$

Q15

Answer :

(b) $\frac{3}{5} < \frac{2}{3} < \frac{14}{15}$

The given fractions are $\frac{3}{5}$, $\frac{2}{3}$ and $\frac{14}{15}$.

LCM of 5, 3 and 15 = 15

Now, we have:

$\frac{2}{3} \times \frac{5}{5} = \frac{10}{15}$, $\frac{3}{5} \times \frac{3}{3} = \frac{9}{15}$ and $\frac{14}{15} \times \frac{1}{1} = \frac{14}{15}$

Clearly, $\frac{9}{15} < \frac{10}{15} < \frac{14}{15}$

$\therefore \frac{3}{5} < \frac{2}{3} < \frac{14}{15}$

Q16

Answer :

(c) 44 km

Distance covered by the car on $2\frac{3}{4}$ L of petrol = $\left(16 \times 2\frac{3}{4}\right)$ km

= $\left(16 \times \frac{11}{4}\right)$ km

= (4 × 11) km = 44 km

Q17

Answer :

(a) $10\frac{1}{2}$ hours

Time taken by Lalit to read the entire book = $\left(6 \times 1\frac{3}{4}\right)$ h

= $\left(6 \times \frac{7}{4}\right)$ h

= $\left(\frac{21}{2}\right)$ h = $10\frac{1}{2}$ h