

Unit 4 Rate, Ratio & Percentage

Exercise 4.1

. Separate the antecedent and consequent of the following the following the second sec	lowing ra	tios.
(i) 7:10	(ii)	25 :
Solution: First term is called antecedent and second	Soluti	on: F
term is called consequent. So,	term is	s calle
Antecedent $= 7$	Antec	edent
Consequent = 10	Conse	quent

(iii) 99:110 Solution: First term is called antecedent and second term is called consequent. So, Antecedent = 99Consequent = 110

(v) 100:300

1.

Solution: First term is called antecedent and second term is called consequent. So, Antecedent = 100Consequent = 300

2. Write the following ratios in words. 3:9 **(i)**

Solution: 3 is to 9

(iii) 45:67 Solution: 45 is to 67

85:100 **(v)** Solution: 85 is to 100

3. Write the following fractions in the form of ratio.

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

Solution: In case of fraction numerator is antecedent and denominator is consequent. So, in the form of ratio

 $\frac{5}{7} = 5:7$

56 (iii) 23

Solution: In case of fraction numerator is antecedent and denominator is consequent. So, in the form of ratio

$$\frac{56}{23} = 56:23$$

(ii) 25:10

Solution: First term is called antecedent and second term is called consequent. So, Antecedent = 25Consequent = 10

(iv) 15:16 Solution: First term is called antecedent and second term is called consequent. So, Antecedent = 15Consequent = 16

(**vi**) 89:96 Solution: First term is called antecedent and second term is called consequent. So, Antecedent = 89Consequent = 96

(ii) 15:27 Solution: 15 is to 27

110:135(iv) Solution: 110 is to 135

(vi) 137:157 **Solution:** 137 is to 157

 $\frac{17}{21}$ (ii)

(iv)

Solution: In case of fraction numerator is antecedent and denominator is consequent. So, in the form of ratio

$$\frac{17}{21} = 17:21$$

Solution: In case of fraction numerator is antecedent and denominator is consequent. So, in the form of ratio

$$\frac{67}{89} = 67:89$$



(v)
$$\frac{121}{125}$$

Solution: In case of fraction numerator is antecedent and denominator is consequent. So, in the form of ratio

$$\frac{121}{125} = 121:125$$

4. Write the following ratios in the form of fraction.

(i) **67:37**

Solution: To write ratio in the form of fraction make first term the numerator and second term the denominator. So, in the form of fraction

$$67:37 = \frac{67}{37}$$

(iii) **87:79**

Solution: To write ratio in the form of fraction make first term the numerator and second term the denominator. So, in the form of fraction

$$87:79 = \frac{87}{79}$$

(v) 125:150

Solution: To write ratio in the form of fraction make first term the numerator and second term the denominator. So, in the form of fraction

$$125:150 = \frac{125}{150}$$

(vi)
$$\frac{26}{30}$$

Solution: In case of fraction numerator is antecedent and denominator is consequent. So, in the form of ratio

$$\frac{26}{30} = 26:30$$

(ii) **105:131**

Solution To write ratio in the form of fraction make first term the numerator and second term the denominator. So, in the form of fraction

$$105:131 = \frac{105}{131}$$

(iv) 31:29

Solution: To write ratio in the form of fraction make first term the numerator and second term the denominator. So, in the form of fraction

$$31:29 = \frac{31}{29}$$

(vi) 300:125

Solution: To write ratio in the form of fraction make first term the numerator and second term the denominator. So, in the form of fraction

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$$_{300:125} = \frac{300}{125}$$

5. Write the given quantities in ratio and reduce into the lowest form.

(i) 800 g to 2 kg

Solution: First of all, make same units of given quantities.

$$1 kg = 1,000 g$$
 so $2 kg = 2,000 g$

It implies

800 g to 2 kg = 800 g : 2,000 g

$$=\frac{8.00}{20.00} = \frac{8^{2}}{20^{5}}$$
$$=\frac{2}{5}$$
$$= 2:5$$

(ii) 10 months to 3 years

Solution: First of all, make same units of given quantities.

1 year = 12 months so 3 years = 36 months

It implies

10 months to 3 years = 10 months : 36 months

 $=\frac{10}{36}$ $=\frac{5}{18}$ =5:18



(iii) 8 minutes to 200 seconds

Solution: First of all, make same units of given quantities.

1 minute = 60 seconds so 8 minutes = 480 seconds It implies

8 minutes to 200 seconds = 480 seconds : 200 seconds

$$=\frac{48\cancel{0}}{20\cancel{0}}=\frac{\cancel{48}^{12}}{\cancel{20}_{5}}$$
$$=\frac{12}{5}$$
$$=12:5$$

(v) **16 feet to 48 feet**

Solution: First of all, make same units of given quantities. Here units are already same. So 16 feet to 48 feet = 16 feet : 48 feet

$$= \frac{16}{48} = \frac{16^{1}}{48_{3}}$$
$$= \frac{1}{3}$$
$$= 1:3$$

6. Simplify the following ratios.

(i) $\frac{1}{14}:\frac{1}{21}$

Solution: To simplify given ratio, write it in the form of fraction.

$$\frac{1}{14} : \frac{1}{21} = \frac{\frac{1}{14}}{\frac{1}{21}} = \frac{1}{14} \times \frac{21}{1} = \frac{21}{14}$$

Now write in the lowest form of fraction

 $\frac{21}{14} = \frac{21 \div 7}{14 \div 7} = \frac{3}{2}$

So, the simplest form is 3:2.

(iii)
$$\frac{1}{4}:2$$

Solution: To simplify given ratio, write it in the form of fraction.

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

So, the simplest form is 1:8.

(iv) 4 weeks to 36 days

Solution: First of all, make same units of given quantities.

1 week = 7 days so 4 week = 28 days It implies

4 weeks to 36 days = 28 days : 36 days

$$=\frac{28^7}{36_9}$$
$$=\frac{7}{9}$$
$$=7\cdot9$$

(vi) 700 metres to 2 kilometres

Solution: First of all, make same units of given quantities.

1 km = 1,000 m so 2 km = 2,000 m

It implies

(ii)

700 m to 2 km = 700 m : 2,000 m

$$= \frac{700}{2000} = \frac{7.00}{20.000}$$
$$= \frac{7}{20}$$
$$= 7:20$$

Solution: To simplify given ratio, write it in the form of fraction.

$$\frac{2}{9}:\frac{1}{3}=\frac{\frac{2}{9}}{\frac{1}{3}}=\frac{2}{9}\times\frac{3}{1}=\frac{6}{9}$$

: 3

Now write in the lowest form of fraction

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

So, the simplest form is 2:3.

(iv) $\frac{1}{5}:\frac{1}{10}:\frac{1}{15}$

Solution: To simplify given ratios, multiply all fraction by LCM of denominators which is 30. So

$$\frac{1}{5}:\frac{1}{10}:\frac{1}{15}=\frac{1}{5}\times 30:\frac{1}{10}\times 30:\frac{1}{15}\times 30$$
$$=6:3:2$$

So, the simplest form is 6:3:2.



(v) 50:150:250

Solution: To simplify given ratios, divide all by common divisor. Here common divisor is 10. So,

$$50:150:250 = \frac{50}{10}:\frac{150}{10}:\frac{250}{10}$$
$$= 5:15:25$$

Again divide all by common divisor 5.

$$=\frac{5}{5}:\frac{15}{5}:\frac{25}{5}$$
$$=1:3:5$$

So, the simplest form is 1:3:5.

(vi) **0.8:1.6:3.2**

Solution: First of all, change decimals into fractions. So,

$$0.8:1.6:3.2 = \frac{8}{10}:\frac{16}{10}:\frac{32}{10}$$

To write in simplest form multiply all by10.

$$= \frac{8}{10} \times 10: \frac{16}{10} \times 10: \frac{32}{10} \times 10$$

= 8:16:32

Now divide all by common divisor 8.

=1:2:4

So, the simplest form is 1:2:4.

7. Price of sugar per kg is Rs.50 and price of rice per kg is Rs. 100. Write the ratios of sugar to rice and rice to sugar.

Solution: Given that Price of sugar per kg = Rs. 50 and Price of rice per kg = Rs. 100 Ratio of sugar to rice Ratio of rice to sugar Sugar : Rice Rice : Sugar 50:100 100:50Divide both terms by common divisor 10 Divide both terms by common divisor 10 5:1010:5Again divide both terms by common divisor 5 Again divide both terms by common divisor 5 1:22:1So the ratio of sugar to rice is 1 : 2. So the ratio of rice to sugar is 2 : 1.

8. A bus is running with a speed of 50 *km/hr*. Whereas a car is running with a speed of 70 *km/hr*. Find the ratios if speed, bus to car and car to bus. Publishing House Solution: Given that

Speed of bus = 50 km/hr and Speed of car = 70 km/hr				
Ratio of speed, car to bus				
Car : Bus				
70:50				
Divide both terms by common divisor 10				
7:5				
So, the ratio of speed, car to bus is 7 : 5.				
•				

9. Ayesha has 36 pencils. She wants to distribute these pencils between her two friends. Noreen and Fatima in the ratio of 4 : 2. How many pencils her friends will receive from Ayesha? Solution: Given that

> Aysha has = 36 pencils, Number of friends = 2, Given ratio of distribution = 4 : 2Sum of ratio = 4 + 2 = 6

To calculate, how many pencils Aysha's friends receive from him





Hence, Noreen will receive 24 pencils and Fatima will receive 12 pencils.

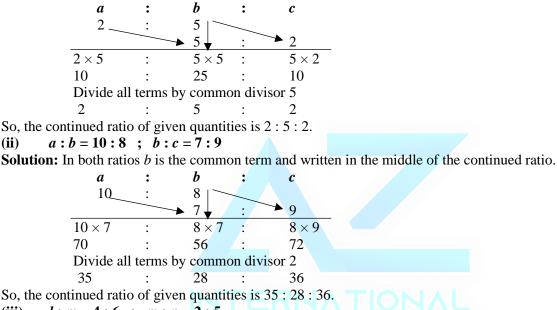
Exercise 4.2

1. Find the continued ratio of three quantities, if:

a:b=2:5; b:c=5:2**(i)**

(ii)

Solution: In both ratios b is the common term and written in the middle of the continued ratio.



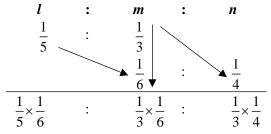
l:m=4:6; m:n=2:5(iii)

Solution: In both ratios *m* is the common term and written in the middle of the continued ratio.

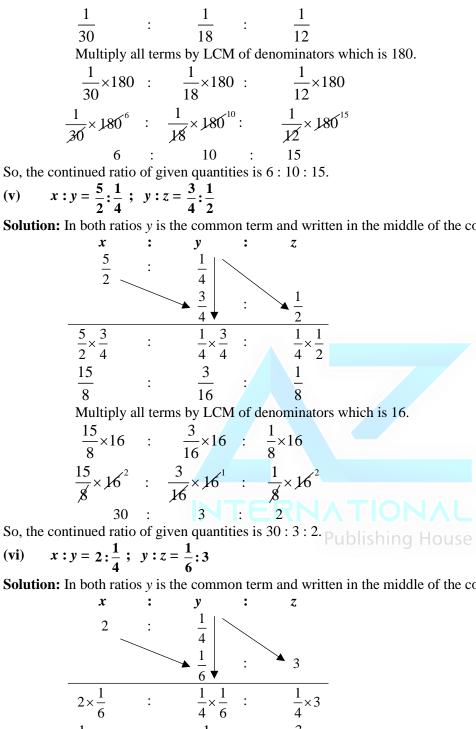
So, the continued ratio of given quantities is 4:6:15.

(iv)
$$l: m = \frac{1}{5}: \frac{1}{3}; m: n = \frac{1}{6}: \frac{1}{4}$$

Solution: In both ratios *m* is the common term and written in the middle of the continued ratio.

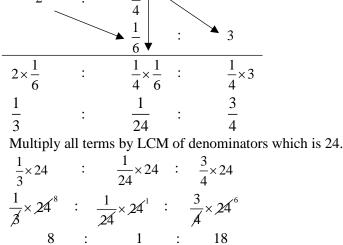






Solution: In both ratios y is the common term and written in the middle of the continued ratio.

Solution: In both ratios y is the common term and written in the middle of the continued ratio.

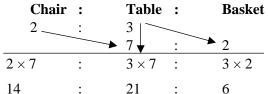


So, the continued ratio of given quantities is 8:1:18.



2. The ratio of the weight of chair to table is 2 : 3 and the ratio of table to basket is 7 : 2. What will be the continued ratio?

Solution: In both ratios *table* is the common term and written in the middle of the continued ratio.



So, the continued ratio of given quantities is 14:21:6.

3. Hafsah has 28 pencils she wants to distribute among three students. The ratio of distribution between Umar and Anaya is 3 : 5 and Anaya and Danish is 4 : 7. Tell that how many number of pencils will each student get?

Solution: Hafsah has =
$$28$$
 pencils, Number of students = 3

In both ratios Anaya is the common term and written in the middle of the continued ratio.

Umar	• :	Anaya :	Danish
3	:	5	
		→ 4 ↓ :	▶ 7
3×4	:	5×4 :	5×7
12	:	20 :	35

So, the continued ratio of given quantities is 12:20:35.

Sum of ratio = 12 + 20 + 35 = 67

To calculate, how many pencils each student get

Umar will recieve =
$$\frac{12}{67} \times 28$$
 Anaya will recieve = $\frac{20}{67} \times 28$ Danish will recieve = $\frac{35}{67} \times 28$
= $\frac{336}{67}$ = $\frac{980}{67}$ = $\frac{980}{67}$ = $\frac{980}{67}$ = $\frac{980}{67}$ = $\frac{15}{67}$

Hence, Umar will get 5 pencils, Anaya will get 8 pencils and Danish will get 15 pencils.

4. Divide Rs. 500 among three children in the ratio 2 : 3 : 5. Solution: The continued ratio of given quantities is 2 : 3 : 5

Solution: The continued ratio of given quantities is 2 : 3 : 5.

Sum of ratio = 2 + 3 + 5 = 10

To calculate, how many rupees each child get

$$1^{\text{st}} \text{ child} = \frac{2}{10} \times 500 \qquad 2^{\text{nd}} \text{ child} = \frac{3}{10} \times 500 \qquad 3^{\text{rd}} \text{ child} = \frac{5}{10} \times 500$$
$$= \frac{100 \cancel{0}}{\cancel{10}} \qquad = \frac{150 \cancel{0}}{\cancel{10}} \qquad = \frac{250 \cancel{0}}{\cancel{10}}$$
$$= 100 \qquad = 150 \qquad = 250$$

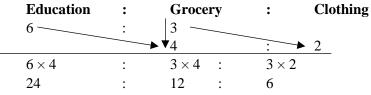
Hence, 1st child will get 100 rupees, 2nd child will get 150 rupees and 3rd child will get 250 rupees.



5. Zubair's monthly income is Rs. 28,000. He spends his income on education and grocery in the ratio 6 : 3 and grocery and clothing in the ratio 4 : 2. Find his monthly expenditure on education, grocery and clothing.

Solution: Zubair's monthly income = Rs. 28,000

In both ratio grocery is the common term and written in the middle of the continued ratio.



So, the continued ratio of given quantities is 24: 12: 6.

Sum of ratio = 24 + 12 + 6 = 42

To calculate, expenditure on each quantity

Education =
$$\frac{24}{42} \times 28,000$$
 Grocery = $\frac{12}{42} \times 28,000$ Clothing = $\frac{6}{42} \times 28,000$
= $\frac{672,000}{42}$ = $\frac{336,000}{42}$ = $\frac{168,000}{42}$
= 16,000 = 4,000

Hence, Zubair's expenditure on education, grocery and clothing is Rs. 16,000, Rs. 8,000 and Rs. 4,000 respectively.

(ii)

second quantity.

Exercise 4.3

1. Convert the following in unit rate:

(i) 200 litres in 5 minutes

Solution: To find the unit rate divide first quantity by second quantity.

$$=\frac{200 \,\text{litres}}{5 \,\text{min}}$$

$$= 40$$
 litre / min

 $\frac{1}{100} = \frac{6,000 \text{ litres}}{5 \text{ min}}$ = 1,200 litre / min

6,000 litres in 5 minutes

(iii) 200 pages in 10 hours

Solution: To find the unit rate divide first quantity by second quantity.

$$= \frac{200 \text{ pages}}{10 \text{ hours}}$$
$$= 20 \text{ pages / hour}$$

(v) 450 metres in 50 seconds

Solution: To find the unit rate divide first quantity by second quantity.

 $=\frac{450 \text{ metres}}{5 \text{ sec}}$

 $= 90 \, \text{metres} / \sec$

2. The cost of 20 metre ribbon is Rs. 400. Find the rate per metre. Solution: Given that, cost of 20 metre ribbon = Rs. 400

(iv) 144 kilometres in 3 hours

Solution: To find the unit rate divide first quantity by second quantity.

Solution: To find the unit rate divide first quantity by

$$=\frac{144 \,\text{kilometres}}{3 \,\text{hours}}$$

= 48 kilometres / hour



To find rate per metre $=\frac{\text{Rs.}400}{20\,\text{m}}$ = Rs.20/metre

Hence, the rate of ribbon is Rs. 20 per metre.

3. Salma purchased 50 kg wheat for Rs. 2,500. Find the rate of wheat per kg. Solution: Given that

Cost of 50 kg wheat = Rs. 2,500To find rate per kg $=\frac{\text{Rs.}\,2,500}{50\,\text{kg}}$ = Rs.50 / kg

Hence, the rate of wheat is Rs. 50 per kg.

1. Solve the following.

Exercise 4.4

15% of Rs. 990 **(ii)** 23% of 240 l **(i)** Solution: To calculate it write percentage in fraction. Solution: To calculate it write percentage in fraction. 15% of Rs.990 = $\frac{{}^{3}15}{{}_{2}100} \times 990$ 23% of 240 $l = \frac{23}{5100} \times 24^{12}$ Ø $=\frac{23\times12}{5}$ $=\frac{3\times99}{2}$ $=\frac{276}{5}$ $=\frac{297}{2}$ =148.5= 55.2So, 23% of 240 *l* is 55.2 *l*.

So, 15% of Rs. 990 is Rs. 148.5.

 $1\frac{5}{9}\%$ of 175 km (iii)

1

Solution: To calculate it write percentage in fraction..

$$\frac{15}{9}\% \text{ of } 175 \text{ km} = \frac{14/9}{100} \times 175$$
$$= \frac{14}{900} \times 175$$
$$= \frac{14}{900} \times 175$$
$$= \frac{2450}{900}$$
$$= 2.72$$

So, $1\frac{5}{9}\%$ of 175 km is 2.72 km.

7.2% of 2,100 (iv)

Solution: To calculate it write percentage in fraction.

7.2% of 2100 =
$$\frac{7.2}{100} \times 2100$$

= $\frac{72/10}{100} \times 2100$
= $\frac{72}{10.00} \times 2100$
= $\frac{1512}{10}$
= 151.2

So, 7.2% of 2,100 is 151.2.



(v) 2.5% of 120 cmSolution: To calculate it write percentage in fraction.

2.5% of 120 cm =
$$\frac{2.5}{100} \times 120$$

= $\frac{\frac{25}{100} \times 120}{100} \times 120$
= $\frac{25}{1000} \times 120$
= $\frac{300}{100} = 3$

(vi) 50% of Rs. 2,500 Solution: To calculate it write percentage in fraction. 50% of Rs 2 $500 = \frac{50}{2} \times 2500$

$$50\% \text{ of Rs. 2, } 500 = \frac{100}{100} \times 25\%$$

= 50×25
= 1250
So, 50% of Rs. 2,500 is Rs. 1,250.

So, 2.5% of 120 cm is 3 cm.

2. In the first month, Salma used 20 kg wheat out of 30 kg. In the second month, she used 22 kg out of 25 kg. In which month did she use more wheat?

Solution: Given that

In the first month, Salma used 20 kg wheat out of 30 kg.

In the second month, Salma used 22 kg out of 25 kg.

Now, calculate percentage for:

First month = $\frac{20}{30} \times 100$	Sec ond month = $\frac{22}{25} \times 100$
_2000	_ 2200
$-\frac{30}{30}$	$-\overline{25}$
= 66.7 %	= 88 %

Hence, Salma used more wheat in the second month.

3. Zeeshan read 280 pages of a book out of 400 pages. Sana read 290 pages of another book out of 350 pages. Who read more number of pages?

Solution: Given that

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Zeeshan read 280 pages of a book out of 400 pages. Sana read 290 pages of a book out of 350 pages. Now, calculate percentage for:

$\text{Zeeshan} = \frac{280}{400} \times 100$	$Sana = \frac{290}{350} \times 100$
_ 28000	_ 29000
= <u>400</u>	$=\frac{350}{350}$
= 70%	= 82.85%

Hence, Sana read more number of pages than Zeeshan.

4. In the first month, Ahmed spent Rs. 28,500 out of Rs. 30,000. In the second month he spent Rs. 29,000 out of Rs. 35,000. In which month did she spend more amount?

Solution: Given that

In the first month, Ahmed spent Rs. 28,500 out of Rs. 30,000. In the second month, Ahmed spent Rs. 29,000 out of Rs. 35,000. Now, calculate percentage for:



$First month = \frac{28500}{30000} \times 100$	Sec ond month = $\frac{29000}{35000} \times 100$
_ 285-0000	_ 2900-000-
	- 35,000
= 95 %	= 82.86 %

Hence, Ahmed spent more amount in the first month.

5. Zainab read 50 pages of a novel out of 80 pages. Rehan read 40 pages of another novel out of 50 pages. Who did read the more number of pages?

Solution: Given that

Zainab read 50 pages out of 80 pages.

Rehan read 40 pages out of 50 pages.

Now, calculate percentage for:

$Zainab = \frac{50}{80} \times 100$	$\operatorname{Rehan} = \frac{40}{50} \times 100$
_5000	_4000
$-\frac{1}{80}$	50
= 62.5 %	= 80 %

Hence, Rehan read more number of pages than Zainab.

6. In a competition, Aslam ate 4 biscuits out of 9 biscuits. Sana ate 5 biscuits out of 6 biscuits. Who ate more? Also tell who won the game?

Solution: Given that

Aslam ate 4 biscuits out of 9 biscuits. Sana ate 5 biscuits out of 6 biscuits. Now, calculate percentage for:

Aslam =
$$\frac{4}{9} \times 100$$

= $\frac{400}{9}$
= 44.44%
Sana = $\frac{5}{6} \times 100$
= $\frac{500}{6}$
= 83.33%

Hence, Sana ate more biscuits and won the game.

7. Usama's monthly income is Rs. 32,000. His expenditure is 89% of his monthly income. Find his expenditure and his savings.

Solution: Given that

Usama's monthly income = Rs. 32,000 Expenditure = 89% of monthly income

Savings = Remaining amount

Expenditure =
$$\frac{89}{100} \times 32000$$
 Savings = Total amount – Expenditure
= 89×320 = $Rs. 32,000 - Rs. 28,480$
= $28,480$ = $Rs. 3520$

Hence, Usama's monthly expenditure and savings are Rs. 28,480 and Rs. 3,520 respectively.



8. There are 60 students in the class, if 70% of students use red colour for painting, how many students do not use red colour for painting?

Solution: Given that Total students = 60

Students who used red colour for painting = 70%

Students who do not use red colour for painting = ?

Students who used red colour for painting = $\frac{70}{100} \times 60$

$$=\frac{42.00}{1.00}$$

= 42 Students

Students who do not use red colour for painting = 60 - 42

=18Students

Hence, 18 students do not use red colour for painting.

9. There are 900 teachers in a city. If 400 teachers are male, then find the percentage of female teachers in this city.

Solution: Given that Total teachers = 900, Male teachers = 400, Female teachers = 500. Percentage of female teachers = ?

> $=\frac{500.00}{9.00}$ = 55.5%

Percentage of female teachers =
$$\frac{500}{200} \times 100$$

Hence, the percentage of female teachers is 55.5%.

10. There are three candidates in an election. Candidate 'A' got 35% of the total votes cast. Candidate 'B' got 25% of the total votes cast. How many votes obtained by Candidate 'C' if the total number of votes cast is 2,500?

Solution: Given that

Total number of candidates = 3

Total number of votes = 2,500

Candidate 'A' got = 35% votes, Candidate 'B' got = 25% votes, Candidate 'C' got = ?

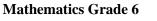
It implies that Candidate 'C' got 40% votes.

Now, we have to calculate 40% of total votes

$$40\% \text{ of } 2,500 = \frac{40}{100} \times 2,500$$
$$= 40 \times 25$$
$$= 1,000$$

Hence, Candidate 'C' got 1,000 votes.

11. Aslam has read 105 pages of a story book, which are 70% of the total number of pages. How many pages he has to read?





Solution: Suppose that, total number of pages be "x" Aslam has read = 70% of x According to given condition 70% of x = 105 $\frac{70}{100} \times x = 105$ $\frac{70}{100} = 105$ Multiply both sides by 100 $\frac{70x}{100} \times 100 = 105 \times 100$ 70x = 10,500Divide both sides by 70 $\frac{70x}{70} = \frac{10,500}{70}$ x = 150Number of pages left to read = Total pages – Read pages = 150 - 105 = 45Hence, Aslam has to read 45 pages.

12. Ahmad got 778 marks out of 1,100 marks. Usama got 887 marks out of 1,000. Who got higher marks? Solution: Given that

Ahmad got 778 marks out of 1,100 marks. Usama got 887 marks out of 1,000 marks. Now, calculate percentage for:

Ahmad got = $\frac{778}{1100} \times 100$	Usama got = $\frac{887}{1000} \times 100$
_778	_ <u>887</u> Publishing House
$-\frac{11}{11}$	$-\frac{10}{10}$
= 70.73%	= 88.7 %

Hence, Usama got higher marks.

13. Noor has Rs. 8,900. He paid tax of 15%. Find the amount which he spent for the tax and remaining amount left with him.

Solution: Noor has = Rs. 8,900 Rate of tax = 15% Amount of tax =? Remaining amount =? Now, we will calculate amount of tax and remaining amount using percentage Amount of tax = 15% of 8,900 Re maining amount = Rs.8,900 - Rs.1,335 $=\frac{15}{100} \times 8,900$ Re maining amount = Rs.7,565

$$= \frac{1}{100} \times 8,900$$

= 15 × 89
= Rs. 1,335

Hence, he spent Rs. 1,335 on tax and remaining amount is Rs. 7,565.



Exercise 4.5

1. A shopkeeper increases the price of sugar per kg 5%. If the old price of sugar per kg was Rs. 60. What will be the new price of sugar per kg?

Solution: Given that

The old price of sugar per kg = Rs. 60

The shopkeeper increases the price of sugar per kg 5%.

New price of sugar per kg = ?

Firstly, calculate 5% of 60 and then add in the old price to calculate new price of sugar per kg.

5% of $60 = \frac{5}{100} \times 60$ $= \frac{300}{100}$ = 3New price of sugar per kg = old price + 5% of 60 = Rs. 60 + Rs. 3 = Rs. 63

Hence, the new price of sugar is Rs. 63 per kg.

2. A shopkeeper decreases the price of rice per kg 10%. If the old price of rice per kg was Rs. 110. What will be the new price of rice per kg?

Solution: Given that

The old price of rice per kg = Rs. 110

The shopkeeper decreases the price of rice per kg 10%.

New price of rice per kg = ?

Firstly, calculate 10% of 110 and then subtract from the old price to calculate new price of rice per kg.

 $10\% \text{ of } 110 = \frac{10}{100} \times 110 \text{ TERNATIONAL}$ $= \frac{1100}{100} = 11 \text{ Publishing House}$

New price of rice per kg = old price -10% of 110

Hence, the new price of rice is Rs. 99 per kg.

3. Solve the following.

(i) Increase 650 by 25%

Solution: Firstly, calculate 25% of 650 and then add in the given value.

25% of
$$650 = \frac{25}{100} \times 650$$

= $\frac{1625\cancel{0}}{10\cancel{0}}$
= 162.5

So, Increase in 650 by 25% = 650 + 162.5 = 812.5

(ii) Increase 1500 by 7.5%

Solution: Firstly, calculate 7.5% of 1500 and then add in the given value.

7.5% of 1500 =
$$\frac{7.5}{100} \times 1500$$

= $\frac{75/}{100} \times 1500$
= $\frac{75}{1000} \times 1500$
= 112.5
So, Increase in 1,500 by 7.5% = 1,500 + 112.5
= 1612.5



.25

(iii) Increase 3,000 by 10%

Solution: Firstly, calculate 10% of 3,000 and then add in the given value.

$$10\% \text{ of } 3000 = \frac{10}{100} \times 3000$$
$$= \frac{300.00}{1.00}$$
$$= 300$$
So, Increase in 3,000 by 10% = 3,000 + 300
= 3,300

4. Solve the following.

(i) **Decrease 780 by 8%**

Solution: Firstly, calculate 8% of 780 and then subtract from the given value.

$$8\% \text{ of } 780 = \frac{8}{100} \times 780$$
$$= \frac{624\cancel{0}}{10\cancel{0}}$$
$$= 62.4$$

So, Decrease in 780 by 8% = 780 - 62.4= 717.6

(iii) Increase 2,300 by 12%

Solution: Firstly, calculate 12% of 2,300 and then subtract from the given value.

12% of 2300 =
$$\frac{12}{100} \times 2300$$

= 12 × 23
= 276
So, Decrease in 2,300 by 12% = 2,300 - 276
= 2024

(iv) Increase 7,850 by 12.5%

Solution: Firstly, calculate 12.5% of 7,850 and then add in the given value.

12.5% of 7850 =
$$\frac{12.5}{100} \times 7850$$

= $\frac{125}{100} \times 7850$
= $\frac{125}{1000} \times 7850$
= 981.25
So, Increase in 7,850 by 12.5% = 7,850 + 981
= 8831.25

(ii) Decrease 220 by 10%

Solution: Firstly, calculate 10% of 220 and then subtract from the given value.

10% of 220 =
$$\frac{10}{100} \times 220$$

= $\frac{22.00}{1.00}$
= 22
So, Decrease in 220 by 10

So, Decrease in 220 by 10% = 220 - 22 = 198

(iv) Increase 3,600 by 15%

Solution: Firstly, calculate 15% of 3,600 and then subtract from the given value.

$$15\% \text{ of } 3600 = \frac{15}{100} \times 3600$$
$$= 15 \times 36$$
$$= 540$$
So, Decrease in 3,600 by $15\% = 3,600 - 540$
$$= 3,060$$

5. The cost of a packet of oil was Rs. 350. The seller increased its price by 28%. Find the new price of the oil packet.

Solution: Given that

The cost of packet of oil = Rs. 350

The seller increased the price of oil by 28%.

New price of packet of oil = ?

Firstly, calculate 28% of 350 and then add in the old price to calculate new price of packet of oil.



 $28\% \text{ of } 350 = \frac{28}{100} \times 350$ $= \frac{9800}{100}$ = 98New price of packet of oil = old price + 28\% of 350 = Rs. 350 + Rs. 98 = Rs. 448

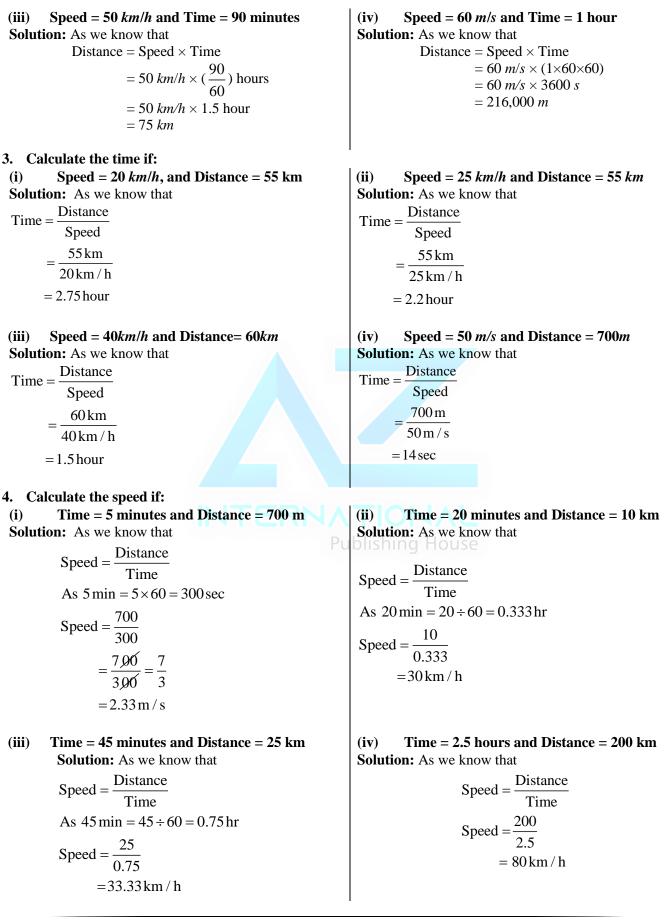
Hence, the new price of packet of oil is Rs. 448.

6. In the month of Eid, the cost of a pair of shoes was Rs. 2,500. The shopkeeper decreased its price by 15%. Find the selling price of the pair of shoes.

Solution: Given that The cost of a pair of shoes = Rs. 2,500 The shopkeeper decreased its price by 15%. New price of the pair of shoes = ? Firstly, calculate 15% of 2500 and then subtract from the old price to calculate new price.

 $15\% \text{ of } 2500 = \frac{15}{100} \times 2500$ $=15 \times 25$ = 375New price of the pair of shoes = old price -15% of 2,500 = Rs. 2,500 - Rs. 375 = Rs. 2,125 Hence, the new price of the pair of shoes is Rs. 2,125. **Exercise 4.6** 1. Convert the given time into 24-hour format. 08:00 a.m. (ii) 09:15 p.m. (i) **Solution:** 08:00 a.m. = 08:00 **Solution:** 09:15 p.m. = 09+12 : 15 = 21:15(iii) 07:44 p.m. (iv) 05:18 a.m. **Solution:** 05:18 a.m. = 05:18 **Solution:** 07:44 p.m. = 07+12 : 44 = 19:44**(v)** 08:57 a.m. (**vi**) 12:58 a.m. **Solution:** 08:57 a.m. = 08:57 **Solution:** 12:58 a.m. = 12-12:58= 00:582. Calculate the distance if: Speed = 20 km/h and Time = 2.5 hours Speed = 45 km/h and Time = 50 minutes **(i) (ii)** Solution: As we know that Solution: As we know that $Distance = Speed \times Time$ $Distance = Speed \times Time$ $= 45 \ km/h \times (\frac{50}{60}) \text{ hours}$ $= 20 \ km/h \times 2.5 \ hours$ $= 50 \ km$ $=45 \text{ km/h} \times 0.83 \text{ hour}$ $= 37.5 \ km$







5. Ahmed covered a distance of 20 km in 4 hours by a bicycle. What is the speed of Ahmad's cycle? Solution: Given that, Distance = 20 km, Time = 4 hours

Speed =
$$\frac{\text{Distance}}{\text{Time}}$$

Speed = $\frac{20 \text{ km}}{4 \text{ hours}}$
= $5 \text{ km} / \text{ h}$

Hence, the speed of Ahmad's cycle is 5 km/h.

6. A car speed is 70 km/h. How much time it takes to cover 280 km?

Solution: Given that, Speed = 70 km/h, Distance = 280 km

$$Time = \frac{Distance}{Speed}$$
$$Time = \frac{280 \text{ km}}{70 \text{ km} / \text{ h}}$$
$$= 4 \text{ hr}$$

Hence, the car will take 4 hours to cover the given distance.

7. Ayesha cycled for 2 hours at a speed of 15 km/h. What distance did she cover?

Solution: Given that, Speed = 15 km/h, Time = 2 hours

 $Distance = Speed \times Time$

 $=15 \text{ km}/\text{h} \times 2\text{h}$

 $= 30 \,\mathrm{km}$

Hence, Ayesha covered the distance of 30 km.

8. A whale swims at a constant speed of 8 m/s for 25 seconds. What distance did it travel?

Solution: Given that, Speed = 8 m/s, Time = 25 sec Distance = Speed × Time

 $= 8 \, m \, / \, s \times 25 \, sec$

 $= 200 \, m$

Hence, the whale covered the distance of 200 metres.

Review Exercise 4

1. Choose the correct option.

(i)	"Pere	centum" is a:						
	(a)	Greek word			(b)	Latin word		
	(c)	English word			(d)	Persian word		
(ii)	Perce	entage is a fracti	on of ty	wo numbers	whose denor	minator is:		
	(a)	100	(b)	%	(c)	50	(d)	100
(iii)	56%	of 100 is:						
	(a)	46	(b)	65	(c)	56	(d)	44
(iv)	45 in	to percentage is:						
	(a)	40%	(b)	50%	(c)	80%	(d)	45%



(v) (vi)	30% of 450 <i>l</i> is: (a) 145 <i>l</i>	(1.)					
	()	(1.)					
(vi)		(b)	130 <i>l</i>	(c)	150 <i>l</i>	(d)	135 <i>l</i>
	31% into decima	al is:					
	(a) 0.031	(b)	0.31	(c)	31	(d)	0.13
(vii)	Profit is calculat		ling price is:			_	
		cost price	1	(b)	equal to cos	•	
		an cost price	-	(d)	none of thes		
(viii)	The concession v		0				
	(a) profit	(b)	selling pric		cost price	(d)	discount
(ix)	The comparison						
	(a) ratio	(b)	rate	(c)	proportion	(d)	continued ratio
(x)	The ratio among						
	(a) rate	(b)	ratio	(c)	continued ra	atio (d)	proportion
Total p Percent Percent Hence, The p Solutio The print The sel	≈ 65 the percentage of	emale = ? $\frac{00}{00} \times 100$ $\frac{00.00}{7.00}$ % males is 65% as Rs. 600. T Rs. 600	Pero and percenta The seller inc	centage of age of fema reased its J	$=\frac{600.0}{17.00}$ $\approx 35\%$ les is 35%.	$\frac{\Theta}{5}$	selling price of the watch
15% of Selling Hence A bus distar	calculate 15% of 6 f $600 = \frac{15}{100} \times 600$ $= 15 \times 6$ = 90 price of the watch e, the selling price of travelled 440 km ince the bus will be ion: Given that	f = old price + Rs. 600 + Rs. 690 of the watch in 5 hours.	+ 15% of 600 Rs. 90 is Rs. 690. How much d	-		-	our. Also tell how much



$$Rate = \frac{440}{5} = 88 \, \text{km} \, / \, \text{h}$$

It means, the bus covered 88 km in one hour.

Now, to calculate how much distance the bus will be covered in 8 hours multiply the rate by 8. Distance the bus will be covered in 8 hours = 88×8

$$= 704 \text{ km}$$

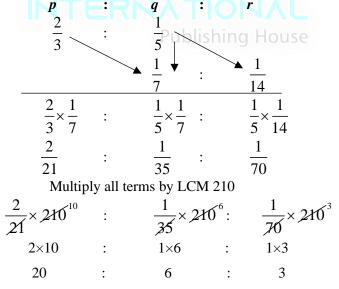
5. Write the following fraction into ratio and express in lowest form.

78 136 55 (iii) (i) **(ii)** 128 208 125 **Solution:** First we will find its Solution: First we will find its Solution: First we will find its lowest form. Divide numerator lowest form. Divide numerator and lowest form. Divide numerator and denominator by common denominator by common divisor. and denominator by common $\frac{136}{208} = \frac{136 \div 4}{208 \div 4} = \frac{34}{52}$ divisor. divisor. $\frac{78}{128} = \frac{78 \div 2}{128 \div 2}$ $\frac{55}{125} = \frac{55 \div 5}{125 \div 5}$ $=\frac{34\div 2}{52\div 2}=\frac{17}{26}$ $=\frac{39}{64}$ $=\frac{11}{25}$ =17:26= 39:64=11:25

6. Find the continued ratio in given quantities.

(i) $p:q=\frac{2}{3}:\frac{1}{5}; q:r=\frac{1}{7}:\frac{1}{14}$

Solution: In both ratios q is the common term and written in the middle of the continued ratio.

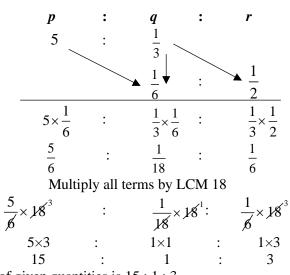


So, the continued ratio of given quantities is 20:6:3.

(ii)
$$l:m=5:\frac{1}{3}; m:n=\frac{1}{6}:\frac{1}{2}$$

Solution: In both ratios q is the common term and written in the middle of the continued ratio.



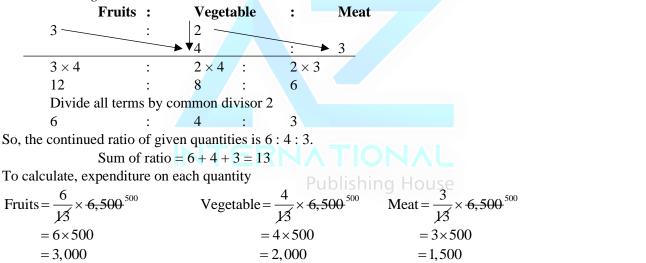


So, the continued ratio of given quantities is 15:1:3.

7. Danish has Rs 6,500. He spent the amount on fruits and vegetable in the ratio 3:2 and vegetable and meat in the ratio 4:3. Find his expenditure on fruits, vegetable and meat.

Solution: Given that, Danish has = Rs. 6,500

In both ratio vegetable is the common term and written in the middle of the continued ratio.



Hence, Danish's expenditure on fruits, vegetables and meat is Rs. 3,000, Rs. 2,000 and Rs. 1,500 respectively. 8. Convert the given time into 24-hour format.

(i) 07:15 a.m.	(ii) 01:25 a.m.	(iii) 09:45 p.m.
Solution: In 24-hour format	Solution: In 24-hour format	Solution: In 24-hour format
07:15 a.m. = 07:15	01:25 a.m. = 01:25	09:45 p.m. = 09+12:45
		= 21:45

9. Shahzad covered a distance of 980 meters in 12 minutes. what was his speed in m/s?

Solution:

As
$$12 \min = 12 \times 60 = 720 \sec$$

Speed $= \frac{980}{720} = \frac{980}{720} = \frac{980}{722} = \frac{980}{722} = \frac{980}{36} = \frac{49}{36}$
 $= 1.361 \text{ m/s}$

Speed = $\frac{\text{Distance}}{\text{Time}}$