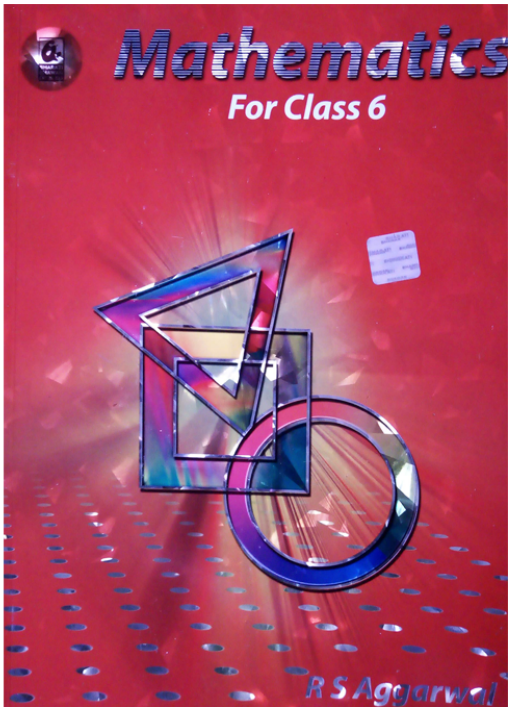
RS Aggarwal Solutions for Class 6 Maths Chapter 10–Ratio, Proportion and Unitary Method

Class 6 - Chapter 10 Ratio, Proportion and Unitary Method



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RS Aggarwal Solutions for Class 6 Maths Chapter 10–Ratio, Proportion and Unitary Method

Class 6: Maths Chapter 10 solutions. Complete Class 6 Maths Chapter 10 Notes.

RS Aggarwal Solutions for Class 6 Maths Chapter 10–Ratio, Proportion and Unitary Method

RS Aggarwal 6th Maths Chapter 10, Class 6 Maths Chapter 10 solutions

Ex 10A Solutions

Question 1.

Solution:

(i) 24 to 56

= 2456

= 24÷856÷8

(HCF of 24, 56 = 8)

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

(ii) 84 paise to Rs. 3 = 84 p : 300 p

$$= \frac{84}{300} = \frac{84 \div 12}{300 \div 12}$$

(HCF of 84 and 300 = 12)

$$= \frac{7}{25} = 7 : 25$$

(iii) 4 kg to 750 g = 4000 g : 750 g

$$= \frac{4000}{750} = \frac{4000 \div 250}{750 \div 250}$$

$$750\overline{)4000}(5$$
$$\underline{3750}$$
$$250\overline{)750}(3$$
$$\underline{750}$$
$$\times$$

(HCF of 4000 and 750 = 250)

$$= \frac{16}{3} = 16 : 3$$

(iv) 1.8 kg to 6 kg $= \frac{18}{10} : 6$

$$= 18 : 60 = \frac{18}{60} = \frac{18 \div 6}{60 \div 6}$$

(HCF of 18, 60 = 6)

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

(v) 48 minutes to 1 hour
= 48 minutes : 60 minutes
= 48 : 60 = 4 : 5

(vi) 2.4 km to 900 m

$$= 2400 \text{ m} : 900 \text{ m} = \frac{2400}{900}$$

$$= \frac{2400 \div 300}{900 \div 300}$$

(HCF of 2400 and 900 = 300)

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

Question 2.

Solution:

(i) 36 : 90

= 3690

= 36÷1890÷18

(HCF of 36, 90 = 18)

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

(*ii*) The given ratio = 324 : 144 = $\frac{324}{144}$

To express it in simplest form, we divide the numerator and denominator by the H.C.F. of 324 and 144.

Now, H.C.F. of 324 and 144

$$
\begin{array}{r}
144 \overline{)\,324\,(\,2} \\
\underline{288} \\
36 \overline{)\,144\,(\,4} \\
\underline{144} \\
\times
\end{array}
$$

= 36

$\therefore \quad \frac{324}{144} = \frac{324 \div 36}{144 \div 36} = \frac{9}{4}$

$\therefore$ Required ratio = 9 : 4.

(*iii*) The given ratio is $85 : 561 = \frac{85}{561}$

To express it in simplest form, we divided the numerator and denominator by the HCF of 85 and 561.

Now, HCF of 85 and 561 = 17

$$
\begin{array}{r}
85 \overline{)\,561\,(\,6} \\
\underline{510} \\
51 \overline{)\,85\,(\,1} \\
\underline{51} \\
34 \overline{)\,51\,(\,1} \\
\underline{34} \\
17 \overline{)\,34\,(\,2} \\
\underline{34} \\
0
\end{array}
$$

$\therefore \frac{85}{561} = \frac{85 \div 17}{561 \div 17} = \frac{5}{33}$

$\therefore$ Required ratio = 5 : 33.

(*iv*) The given ratio = 480 : 384 = $\frac{480}{384}$

To express it in simplest form, we divide the numerator and denominator by the HCF of 480 and 384.

Now, HCF of 480 and 384

= 96

$$
\begin{array}{r}
384 \overline{)\,480\,(\,1} \\
\underline{384} \\
96 \overline{)\,384\,(\,4} \\
\underline{384} \\
0
\end{array}
$$

$$\therefore \frac{480}{384} = \frac{480 \div 96}{384 \div 96} = \frac{5}{4}$$

$\therefore$ Required rato = 5 : 4.

(v) The given ratio = $186:403 = \frac{186}{403}$

To express it in the simplest form, we divide its numerator and denominator by the HCF of 186 and 403.

Now, HCF of 186 and 403 = 31

$$\begin{array}{r} 186 \overline{)\,403\,(\,2} \\ 372 \\ \hline 31 \overline{)\,186\,(\,6} \\ 186 \\ \hline 0 \end{array}$$

$$\therefore \frac{186}{403} = \frac{186 \div 31}{403 \div 31} = \frac{6}{13}$$

$\therefore$ Required ratio = 6 : 13

(vi) $777 : 1147 = \frac{777}{1147}$

To express it in simplest form, we divide its numerator and denominator by the HCF of 777 and 1147

$= \frac{777 \div 37}{1147 \div 37} = \frac{21}{31}$

$$
\begin{array}{r}
777\overline{)1147(}\ 7 \\
\underline{777} \\
370\overline{)777(}\ 2 \\
\underline{740} \\
37\overline{)370(}\ 10 \\
\underline{370} \\
\times
\end{array}
$$

(HCF of 777 and 1147 is 37)

= 21 : 31

Question 3.

Solution:

(i) The given ratio = Rs. 6.30 : Rs. 16.80

= Rs.6.30Rs.16.80

= 6301680

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$= \frac{Rs.6.30}{Rs.16.80}$

$= \frac{630}{1680}$

To express it in simplest form, we divide its numerator and denominator by the HCF of 630 and 1680.

Now, HCF of 630 and 1680 = 210

$$
\begin{array}{r}
630 \overline{)\,1680\,(\,2} \\
1260 \\
\hline
420 \overline{)\,630\,(\,1} \\
420 \\
\hline
210 \overline{)\,420\,(\,2} \\
420 \\
\hline
0 \\
\hline
\end{array}
$$

$\therefore \frac{630}{1680} = \frac{630 \div 210}{1680 \div 210} = \frac{3}{8}$

$\therefore$ Required ratio = 3 : 8

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(*ii*) The given ratio = 3 weeks : 30 days

= (3 × 7) days : 30 days

= 21 days : 30 days

= 21 : 30

= 7 : 10

(*iii*) To given ratio = 3m 5 cm : 35cm

= (3 × 100 + 5) cm : 35 cm

= 305 cm : 35 cm

= 305 : 35

= 61 : 7.

(*iv*) The given ratio = 48 min : 2 hours 40 min

= 48 min : (2 × 60 + 40) min

= 48 min : (120 + 40) min

= 48 min : 160 min

= 48 : 160

= 3 : 10

(v) The given ratio = 1L 35 mL : 270 mL

= (1 × 1000 + 35) mL : 270 mL

= 1035 mL : 270 mL

= 1035 : 270

$= \frac{1035}{270}$

To express it in simplest form, we divide its numerator and denominator by the HCF of 1035 and 270.

```
270 ) 1035 ( 3
      810
      ----
      225 ) 270 ( 1
            225
            ---
            45 ) 225 ( 5
                 225
                 ---
                   0
```

Now, HCF and 1035 and 270 = 45

$\therefore \frac{1035}{270} = \frac{1035 \div 45}{270 \div 45} = \frac{23}{6}$

∴ Required ratio = 23 : 6.

(vi) The given ratio = 4 kg : 2 kg 500 g

= (4 × 1000) g : (2 × 1000 + 500) g

= 4000 g : 2500 g

= 4000 : 2500

= 40 : 25

= 8 : 5

Question 4.

Solution:

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Earning of Sahai = Rs. 16800

and of his wife = Rs. 10500

Then total income = Rs. 16800 + 10500

= Rs. 27300

(i) Ratio in Sahai's income and his wife

$= 16800 : 10500$

$= \frac{16800}{10500} = \frac{16800 \div 2100}{10500 \div 2100}$

(HCF of 16800 and 105000 is 2100)

$= \frac{8}{5} = 8 : 5$

(ii) Ratio in Sahai's wife income and her husband's income

$= 10500$: Rs. 16800

$= 5 : 8$

(Dividing by the HCF of 10500 and 16800 = 2100)

(iii) Sahai's income and total of their income

$= 16800 : 27300 = \frac{16800}{27300}$

$= \frac{16800 \div 2100}{27300 \div 2100} = \frac{8}{13} = 8 : 13$

Question 5.

Solution:

https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-6-maths-chapter-10-ratio-proportion-and-unitary-method/

Rohit monthly earnings = Rs. 15300

and his savings = Rs. 1224

So, his expenditure = Rs. 15300 – 1224

= Rs. 14076

Now,

(i) Ratio in his income and savings

$$= 15300 : 1224 = \frac{15300}{1224}$$

$$\begin{array}{r} 1224\overline{)15300(}\ 12 \\ \underline{1224} \\ 3060 \\ \underline{2448} \\ 612\overline{)1224(}\ 2 \\ \underline{1224} \\ \times \end{array}$$

$$= \frac{15300 \div 612}{1224 \div 612}$$

(Dividing by HCF of 15300 and 1224)

$$= \frac{25}{2} = 25 : 2$$

(ii) Ratio in his income and expenditure

$$= 15300 : 14076 = \frac{15300}{14076}$$

$$= \frac{15300 \div 612}{14076 \div 612} \qquad (\text{HCF} = 612)$$

$$= \frac{25}{23} = 25 : 23$$

(iii) Ratio in his expenditure and savings

$$= 14076 : 1224 = \frac{14076}{1224}$$

$$= \frac{14076 \div 612}{1224 \div 612} = \frac{23}{2}$$

$$= 23 : 2$$

Question 6.

Solution:

Let the number of male and female workers in the mill be 5x and 3x respectively. Then,

5x = 115

=> 5x5 = 1155

(Dividing both sides by 5)

=> x = 23

Number of female workers in the mill

= 3x

= 3 x 23 = 69.

Question 7.

Solution:

Let the number of boys and girls in the school be 9x and 5x respectively.

According to the question,

9x + 5x = 44

=> 14x = 448

=> 14x14 = 44814

(Dividing both sides by 14)

=> x = 32.

Number of girls =5x

= 5 x 32

= 160

Question 8.

Solution:

Total amount = Rs. 1575

Ratio in Kamal and Madhu's share = 7 : 2

Sum of ratios = 7 + 2 = 9

$$\therefore \text{ Kamal's share} = \text{Rs. } \frac{1575 \times 7}{9}$$

$$= \text{Rs. } 175 \times 7 = \text{Rs. } 1225$$

$$\text{Madhu's share} = \text{Rs. } \frac{1575 \times 2}{9}$$

$$= \text{Rs. } 175 \times 2 = \text{Rs. } 350$$

Question 9.

Solution:

Total amount = Rs. 3450

Ratio in A, B and C shares = 3 : 5 : 7

Sum of share = 3 + 5 + 7 = 15

$$\therefore \text{ A's share} = \text{Rs. } \frac{3450 \times 3}{15}$$

$$= \text{Rs. } 230 \times 3 = \text{Rs. } 690$$

$$\text{B's share} = \text{Rs. } \frac{3450 \times 5}{15}$$

$$= \text{Rs. } 230 \times 5 = \text{Rs. } 1150$$

$$\text{C's share} = \text{Rs. } \frac{3450 \times 7}{15}$$

$$= \text{Rs. } 230 \times 7 = \text{Rs. } 1610$$

Question 10.

Solution:

Let the numbers be 11x and 12x.

Then. 11x + 12x = 460

=> 23x = 460

$$\Rightarrow \quad \frac{23x}{23} = \frac{460}{23}$$

(Dividing both sides by 23)

$$\Rightarrow \quad x = 20.$$

∴ Required numbers are (11 × 20) and 12 × 20, that is , 220 and 240.

Question 11.

Solution:

Length of line segment = 35 cm

Ratio = 4 : 3

Sum of ratio = 4 + 3 = 7

$$\therefore \text{ First part } = \frac{35 \times 4}{7} = 20 \text{ cm}$$

$$\text{Second part } = \frac{35 \times 3}{7} = 15 \text{ cm}$$

Question 12.

Solution:

Total bulbs produced per day = 630

Out of every 10 bulbs, defective bulb = 1

Out of every 10 bulbs, lighting bulbs = 10 – 1 = 9

$\therefore$ Ratio of defective bulbs to lighting bulbs = 1 : 9

Sum of the terms of the ratio = (1 + 9)

= 10

$\therefore$ Number of defective bulbs produced each day $= \left(\frac{1}{10} \times 630\right) = 63.$

Question 13.

Solution:

Price of 20 pencils = Rs. 96

(1 score = 20 pencils)

Price of 1 pencil = Rs. (96 ÷ 20)

= Rs. 4.80

Price of 12 ball pens = Rs. 50.40

(1 dozen = 12)

Price of 1 ball pen = Rs. (50.40 ÷ 12)

= Rs. 4.20.

Ratio of the price of a pencil to that of a ball pen = Rs. 4.80 : Rs. 4.20

= 480 paise : 420 paise

= 480 : 420

= 48 : 42

= 8 : 7.

Required ratio = 8 : 7.

Question 14.

Solution:

It is given that the ratio of the length of a field to its width is 5 : 3.

If the width of the field is 3 metres then length = 5 metres.

If the width of the field is 1 metres than length = 53 metres.

If the width of the field is 42 metres then length

= 53 x 42 metres

= 5 x 14 metres

= 70 metres.

Question 15.

Solution:

Ratio in income and savings of a family = 11 : 2

But Total savings = Rs. 1520

Let income = x

11 : 2 = x : 1520

=> x = 11×15202 = 11 x 760

= Rs 8360

Expenditure = total income – savings

= Rs 8360 – 1520

= Rs 6840

Question 16.

Solution:

Ratio in income and expenditure = 7 : 6

Total income = Rs. 14000

Let expenditure = x, then

7 : 6 :: 14000 : x

=>x = 6×140007 = Rs. 12000

Savings = Total income – Expenditure

= Rs. 14000 – 12000

= Rs. 2000

Question 17.

Solution:

It is given that the ratio of zinc and copper in an alloy is 7 : 9.

If the weight of zinc in the alloy is 7 kg then the weight of copper in the alloy is 9 kg.

Now, if the weight of copper is 9 kg then weight of zinc = 7 kg.

If the weight of copper is 1 kg then

weight of zinc $= \frac{7}{9}$ kg.

If the weight of copper is 11.7 kg then weight of zinc

$$= \left(\frac{7}{9} \times 11{\cdot}7\right) \text{kg}$$

$$= (7 \times 1.3) \text{ kg}$$

$$= 9.1 \text{ kg}.$$

Question 18.

Solution:

A bus covers in 2 hours = 128 km

128 It will cover in 1 hour = 1282 = 64 km

A train cover in 3 hours = 240 km

It will cover in 1 hour = 2403

= 80 km

Ratio in their speeds = 64: 80

= 4 : 5

{Dividing by 16, the LCM of 64, 80}

Question 19.

Solution:

(i) (3 : 4) or (9 : 16)

LCM of 4, 16 = 16

$\therefore \frac{3}{4} = \frac{3\times4}{4\times4} = \frac{12}{16}$

We see that $\frac{12}{16} > \frac{9}{16}$ or $\frac{3}{4} > \frac{9}{16}$

$\therefore$ 3 : 4 the greater ratio

(ii) (5 : 12) or (17 : 30)

$\frac{5}{12}, \frac{17}{30}$

LCM of 12 and 30 = 60

$\therefore \frac{5}{12} = \frac{5\times5}{12\times5} = \frac{25}{60}$

and $\frac{17}{30} = \frac{17\times2}{30\times2} = \frac{34}{60}$

We see that $\frac{34}{60} > \frac{25}{60}$ or $\frac{17}{30} > \frac{5}{12}$

$\therefore$ 17 : 30 is greater ratio

(iii) (3 : 7) or (4 : 9)

$\Rightarrow \frac{3}{7}, \frac{4}{9}$

LCM of 7, 9 = 63

$\therefore \frac{3}{7} = \frac{3\times9}{7\times9} = \frac{27}{63}$

$$\frac{4}{9} = \frac{4\times7}{9\times7} = \frac{28}{63}$$

We see that $\frac{28}{63} > \frac{27}{63}$ or $\frac{4}{9} > \frac{3}{7}$

$\therefore$ 4 : 9 is greater ratio

(iv) (1 : 2) or (13 : 27)

$\frac{1}{2}, \frac{13}{27}$

LCM of 2 and 27 = 54

$$\therefore \frac{1}{2} = \frac{1\times27}{2\times27} = \frac{27}{54}$$

and $\frac{13}{27} = \frac{13\times2}{27\times2} = \frac{26}{54}$

We see that $\frac{27}{54} > \frac{26}{54}$ or $\frac{1}{2} > \frac{13}{27}$ $\therefore$ 1 : 2 is greater ratio

Question 20.

Solution:

(i) $\frac{24}{40} = \frac{\square}{5} = \frac{12}{\square}$

$5 = 40 \div 8$ (Dividing by 8)

$\frac{24}{40} = \frac{24 \div 8}{40 \div 8} = \frac{3}{5}$

$12 = 24 \div 2$

$= \frac{24 \div 2}{40 \div 2} = \frac{12}{20}$

Hence $\frac{24}{40} = \frac{3}{5} = \frac{12}{20}$

(ii) $\frac{36}{63} = \frac{4}{\square} = \frac{\square}{21}$

$\frac{36}{63} = \frac{4}{\square}$

$\therefore 4 = 36 \div 9$

$\frac{36}{63} = \frac{36 \div 9}{63 \div 9} = \frac{4}{7}$

and $\frac{36}{63} = \frac{\square}{21}$

$21 = 63 \div 3$

$\therefore \frac{36}{63} = \frac{36 \div 3}{63 \div 3} = \frac{12}{21}$

$\therefore \frac{36}{63} = \frac{4}{7} = \frac{12}{21}$

(iii) $\frac{5}{7} = \frac{\square}{28} = \frac{35}{\square}$

$\frac{5}{7} = \frac{\square}{28}$

$\because 28 = 7 \times 4$

$\therefore \frac{5}{7} = \frac{5 \times 4}{7 \times 4} = \frac{20}{28}$

and $\frac{5}{7} = \frac{35}{\square}$

$\because 35 = 5 \times 7$

$\frac{5}{7} = \frac{5 \times 7}{7 \times 7} = \frac{35}{49}$

$\therefore \frac{5}{7} = \frac{20}{28} = \frac{35}{49}$

Ex 10B Solutions

Question 1.

Solution:

(i) 4, 6, 8, 12

If it is in proportion, then

If ad = bc if 4 x 12 = 6 x 8

If 48 = 48

Which is true

∴ 4, 6, 8, 12 are in proportion

(ii) 7, 42, 13, 78

7 : 42 :: 13 : 78

If ad = bc if 7 x 78 = 42 x 13

If 546 = 546

Which is true

∴ 7, 42, 13, 78 are in proportion

(iii) 33, 121, 9, 96 or 33 : 121 :: 9 : 96

are in proportion

If ad = bc

If 33 x 96 = 121 x 9

If 3168 = 1089

Which is not true

∴ 33, 121,9, 96 are not in proportion

(iv) 22, 33, 42, 63 or 22 : 33 :: 42 : 63

are in proportion

If ad = bc

If 22 x 63 = 33 x 42

If 1386 = 1386

Which is true

∴ 22, 33, 42, 63 are in proportion

(v) 32, 48, 70, 210 or 32 : 48 :: 70 : 210

are in proportion

If ad = bc

If 32 x 210 = 48 x 70

If 6720 = 3360

Which is not true

∴ 32, 48, 70, 210 are not in proportion

(vi) 150, 200, 250, 300 or

150 : 200 :: 250 : 300 are in proportion

If ad = bc if 150 x 300 = 200 x 250

If 45000 = 50000

Which is not true

∴ 150, 200,250, 300 are not in proportion

Question 2.

Solution:

(i) We have 60 : 105 :: 84 : 147

Product of means = 105 x 84 = 8820

Product of extremes = 60 x 147 = 8820

∴ Product of means = Product of extremes

Hence 60 : 105 :: 84 : 147 is verified.

(ii) We have 91 : 104 :: 119 : 136

Product of means = 104 x 119 = 12376

Product of extremes = 91 x 136 = 12376

Product of means = Product of extremes

Hence 91 : 104 :: 119 : 136 is verified.

(iii) We have 108 : 72 :: 129 : 86

Product of means = 72 x 129 = 9288

Product of extremes = 108 x 86 = 9288

Product of means = Product of extremes

Hence 108 : 72 :: 129 : 86 is verified.

(iv) We have 39 : 65 :: 141 : 235

Product of means = 65 x 141 = 9165

Product of extremes = 39 x 235 = 9165

∴ Product of means = Product of extremes

Hence 39 : 65 :: 141 : 235 is verified.

Question 3.

Solution:

(i) We have 55 : 11 :: x : 6

Product of means = 11 × x = 11x

Product of extremes = 55 x 6 = 330

$\therefore 11x = 330 \quad \Rightarrow \quad \frac{11x}{11} = \frac{330}{11}$

(Dividing both sides by 11)

$\Rightarrow \quad x = 30$

(*ii*) We have $27 : x :: 63 : 84$

Product of means $= x \times 63$

Product of extremes $= 27 \times 84$

$\therefore \quad x \times 63 = 27 \times 84$

$\Rightarrow \quad x = \frac{27 \times 84}{63} = 36$

(*iii*) We have $51 : 85 :: 57 : x$

Product of means $= 85 \times 57$

Product of extremes $= 51 \times x$

$\therefore \quad 51 \times x = 85 \times 57$

$\Rightarrow \quad x = \frac{85 \times 57}{51} = 95$

(*iv*) We have $x : 92 :: 87 : 116$

Product of means $= 92 \times 87$

Product of extremes $= x \times 116$

$\therefore x \times 116 = 92 \times 87$

$\Rightarrow \quad x = \frac{92 \times 187}{116} = 69.$

Question 4.

Solution:

(i) We have, 51 : 68 = 5168

= 34

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And, $85:102 = \frac{85}{102} = \frac{5}{6}$

$\therefore$ 51 : 68 $\neq$ 85 : 102

So, the given statement is False.

(*ii*) We have, $36:45 = \frac{36}{45} = \frac{4}{5}$

And $80:100 = \frac{80}{100} = \frac{4}{5}$

$\therefore$ 36 : 45 = 80 : 100

So, the given statement is true.

(*iii*) We have, 30 bags : 18 bags

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

And Rs. 450 : Rs. 270

$= 450:270 = \frac{450}{270} = \frac{5}{3}$

$\therefore$ 30 bags : 18 bags = Rs. 450 : 270

So, the given statement is true.

(*iv*) We have, 81 kg : 45 kg

$= 81 : 45$

$= \frac{81}{45} = \frac{9}{5}$

And, 18 men : 10 men

$= 18 : 10$

$= \frac{18}{10} = \frac{9}{5}$

$\therefore$ 81 kg : 45 kg = 18 men : 10 men

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So, the given statement is true.

(v) We have, 45 km : 60 km

$= 45 : 60$

$= \frac{45}{60} = \frac{3}{4}$

And, 12 h : 15 h

$= 12 : 15$

$= \frac{12}{15} = \frac{4}{5}$

$\therefore$ 45 km : 60 km $\neq$ 12 h : 15 h

So, the given statement is false.

(vi) The given statement is false as the terms of the ratio must have same units.

Question 5.

Solution:

(i) 25 cm : 1 m and Rs. 40 : Rs. 160

= 25cm1000cm = 14,

Rs.40Rs.160 = 14

$\because \frac{1}{4} = \frac{1}{4}$ (Ratio are equal)

$\therefore$ 25 cm : 1 , and Rs. : Rs. 160 are in proportion

(ii) 39 litres : 65 litres and 6 bottles : 10 bottles

$\frac{39}{65} = \frac{3}{5}$ and $\frac{6}{10} = \frac{3}{5}$

$\because \frac{3}{5} = \frac{3}{5}$ (Ratios are equal)

$\therefore$ 39 litres : 65 litres and 6 bottles : 10 bottles are in proportion

(iii) 200 mL : 2.5 L and Rs. 4 : Rs. 50

$\frac{200 \text{ mL}}{2.5 \text{ L}} = \frac{200}{2.5 \times 1000}$

$= \frac{200 \times 10}{25 \times 1000} = \frac{2}{25}$

and $\frac{\text{Rs. } 4}{\text{Rs. } 50} = \frac{2}{25}$

$\therefore \frac{2}{25} = \frac{2}{25}$ (Ratios are equal)

200 mL : 2.5 L and Rs. 4 : Rs. 50 are in proportion

(iv) 2 kg : 80 kg and 25 g : 625 kg

$$\frac{2\text{ kg}}{80\text{ kg}} = \frac{1}{40}$$

$$\text{and } \frac{25\text{ g}}{625\text{ kg}} = \frac{25}{625\times1000} = \frac{1}{25000}$$

$$\because \frac{1}{40} \neq \frac{1}{25000}$$

$\therefore$ 2 kg : 80 kg and 25 g : 625 kg are not in proportion

Question 6.

Solution:

Let the third term be x.

Then 51 : 68 :: x : 108

Now, product of means = x × 68

And, product of extremes = 51 × 108

x × 68 = 51 × 108

=> x = 51×10868

= 3 × 27 = 81

x = 81

Hence the third term of the given proportion is 81

Question 7.

Solution:

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1st term =12, third term = 8 and fourth term = 14

Let 2nd term = x, then

$$12 : x :: 8 : 14$$

$$\therefore x = \frac{12 \times 14}{8} \qquad \left(b = \frac{ad}{c}\right)$$

$$= 21$$

$\therefore$ Second term = 21

Question 8.

Solution:

(i) The given numbers 48, 60, 75 are in

continued proportion if 48 : 60 :: 60 : 75.

Now, product of means = 60 x 60 = 3600

And, product of extremes = 48 x 75 = 3600

$\therefore$ Product of means = Product of extremes

So, 48 : 60 :: 60 : 75

Hence, the numbers 48, 60, 75 are in continued proportion.

(ii) The given numbers 36, 90, 225 are in

continued proportion of 36 : 90 :: 90 : 225

Now, product of means = 90 x 90 = 8100

And, product of extremes = 36 x 225 = 8100

$\therefore$ Product of means = Product of extremes

So, 36 : 90 :: 90 : 225

Hence, the numbers 36, 90, 225 are in continued proportion.

(iii)The given numbers 16, 84, 441 are in

continued proportion if 16 : 84 :: 84 : 441.

Now, product of means = 84 x 84 = 7056

And, product of extremes = 16 x 441 = 7056

Product of means = Product of extremes.

So, 16 : 845 :: 84 : 441

Hence 16, 84, 441 are in continued proportion.

(iv) The given numbers 27, 36, 48 are

in continued proportion if 27 : 36 :: 36 : 48

Now, product of means = 36 x 36 = 1296

And, product of extremes = 27 x 48 = 1296

∴ Product of means = Product of extremes.

So, 27 : 36 :: 36 : 48

Hence, the numbers 27, 36, 48 are in continued proportional.

Question 9.

Solution:

It is given that 9, x, x, 49 are in proportion, that is, 9 : x :: x : 49

∴ Product of means = Product of extremes

$$x \times x = 9 \times 49$$

$\Rightarrow x^2 = 9 \times 49$

$\Rightarrow \quad x = \sqrt{9 \times 49}$

$\Rightarrow \quad x = \sqrt{3 \times 3 \times 7 \times 7}$

$\Rightarrow x = 3 \times 7 = 21.$

$\therefore x = 21$

Question 10.

Solution:

Let the height of the pole be x metres.

$$\text{Now, } \frac{\text{height of the pole}}{\text{length of shadow of pole}} = \frac{\text{Height of the tree}}{\text{Length of shadow of tree}}$$

$$\therefore \quad \frac{x}{20} = \frac{6}{8}$$

$$\Rightarrow x = \frac{6}{8} \times 20$$

$$= \frac{120}{8} = 15$$

$\therefore$ Height of the pole = 15 metres.

Question 11.

Solution:

5 : 3 :: x : 6

$\because\ ad = bc$

$\therefore\ 5 \times 6 = 3 \times x \Rightarrow x = \frac{5 \times 6}{3} = 10$

$\therefore\ x = 10$

Ex 10C Solutions

Question 1.

Solution:

Cost of 14 m of cloth = Rs. 1890

Cost of 1 m = Rs. 189014

and cost of 6 m = Rs. 1890×614

= Rs. 135 x 6

= Rs. 810

Question 2.

Solution:

Cost of 1 dozen or 12 soaps = Rs. 285.60

Cost of 1 soap = Rs. 285.6012

Cost of 15 soaps = Rs. 285.60×1512

= Rs. 357.00

Question 3.

Solution:

Cost of 9 kg of rice = Rs. 327.60

Cost of 1 kg = Rs. 327.609

and cost of 50 kg = Rs. 327.60×509

= Rs. 36.40 x 50

= Rs. 1820

Question 4.

Solution:

Weight of 22.5 metres of the iron rod: = 85.5 kg

Weight of 1 metre of the iron rod

$$= \left(\frac{85{\cdot}5}{22{\cdot}5}\right) \text{kg}$$

Weight of 5 metres of the iron rod

$$= \left(\frac{85{\cdot}5}{22{\cdot}5} \times 5\right) \text{kg}$$

$$= \left(\frac{855}{10} \times \frac{10}{225} \times 5\right) \text{kg}$$

$$= \left(\frac{855}{45}\right) \text{kg} \quad = 19 \text{ kg}$$

Question 5.

Solution:

Quantity of oil in 15 tins = 234 kg

Quantity of oil in 1 tin = 23415 kg

Quantity of oil in 10 tins

$$= \left(\frac{234}{15} \times 10\right) \text{ kg}$$

$$= \left(\frac{234 \times 2}{3}\right) \text{ kg}$$

$$= 156 \text{ kg}$$

Question 6.

Solution:

Distance covered by the car in 12 litres of diesel = 222 kms

Distance covered by the car in 1 litre of diesel = 22212 km

Distance covered by the car in 22 litres

$$\text{of diesel} = \left(\frac{222}{12} \times 22\right) \text{ km}$$

$$= \left(\frac{37}{2} \times 22\right) \text{ km} = 407 \text{ km}$$

Question 7.

Solution:

Charges of 25 tonnes of weight = Rs. 540

charges of 1 ton = Rs.54025

and charges of 35 tonnes = Rs.

$$\frac{540 \times 35}{25}$$

$$= \text{Rs. } 756$$

Question 8.

Solution:

Weight of copper in 4.5 g of alloy = 3.5g

Weight of copper in 1 g of alloy

$$= \left(\frac{3{\cdot}5}{4{\cdot}5}\right) g$$

Weight of copper in $18{\cdot}9\ g$ of alloy

$$= \left(\frac{3{\cdot}5}{4{\cdot}5} \times 18{\cdot}9\right) g$$

$$= \left(\frac{35}{10} \times \frac{10}{45} \times \frac{189}{10}\right) g$$

$$= 14{\cdot}7\ g$$

Question 9.

Solution:

In Rs. 87.50, the inland letter are purchased = 35

In Re. 1, letters can be purchased

= 3587.50

and in Rs. 315, letters can be purchased

$$= \frac{35}{\cdot 87.50}$$

and in Rs. 315, letters can be purchased

$$= \frac{35 \times 315 \times 100}{8750} = 126$$

Question 10.

Solution:

4 dozen = 4 x 12 = 48 bananas

In Rs. 104, banana are purchased = 48

$$\therefore \text{ In Re. 1, banana will be purchased} = \frac{48}{104}$$

and in Rs. 6.50, bananas will be purchased $= \frac{48 \times 6.50}{104}$

$$= \frac{48 \times 650}{104 \times 100} = 3$$

Question 11.

Solution:

In Rs. 22770, chairs are purchased =18

In Re. 1, chairs will be purchased

= 1822770

and in Rs. 10120, chairs will be

purchased = 18×1012022770

= 8

Question 12.

Solution:

(i) A car travels 195 km distance in = 3 hours

It will travel 1 km distance in = 3195 hr.

and it will travel 520 km distance in

= 3×520195

= 8 hr

(ii) A car travels in 3hr = 195 km

$$\text{It will travel in 1 hour} = \frac{195}{3} \text{ km}$$

$$\text{and it will travel in 7 hours} = \frac{195 \times 7}{3}$$

$$= 455 \text{ km}$$

Question 13.

Solution:

(i) A laborer earn in 12 days = Rs. 1980

He will earn in 1 day = Rs. 198012

and he will earn in 7 days

$= \text{Rs. } \frac{1980 \times 7}{12} = \text{Rs. } 1155$

(ii) A labourer earns Rs. 1980 in = 12 days

He will earn Re. 1 in $= \frac{12}{1980}$ days

and he will earn Rs. 2640 in $= \frac{12 \times 2640}{1980}$

days = 16 days

Question 14.

Solution:

(i) Weight of 65 books = 13 kg

Then weight of 1 book = 1365 kg

and in 6.4 kg, the book will be $= \frac{65 \times 6.4}{13}$

= 32 books

Question 15.

Solution:

Number of boxes needed for 6000 pens = 48

Number of boxes needed for 1 pen 48 = 486000

Number of boxes needed for 1875 pens

$$= \frac{48}{6000} \times 1875 = \frac{8}{1000} \times 1875$$
$$= 15$$

Question 16.

Solution:

Clearly, less workers will build the wall in more days.

And, more workers will build the wall in less days.

24 workers can build the wall in 15 days

1 worker can build the wall in (15 x 24) days

(less worker, more days)

9 workers will build the wall in

$$\left(\frac{15 \times 24}{9}\right) \text{ days}$$

(more workers, less days)

$$= \left(\frac{360}{9}\right) \text{ days}$$
$$= 40 \text{ days}$$

Question 17.

Solution:

Men needed to finish a piece of work in 26 days = 40

Men needed to finish a piece of work in 1 day = 40 x 26 (less days, more men)

Men needed to finish a piece of work in

$$16 \text{ days} = \frac{40 \times 26}{16}$$

(more days, less men)

$$= \frac{1040}{16} = 65$$

Question 18.

Solution:

Clearly, less men will take more days to consume the food.

And, more men will take less days to consume the food.

550 men have provisions for 28 days

1 men has provisions for (28 x 550) days [less men, more days]

700 men will have provisions for

$$\left(\frac{28 \times 550}{700}\right) \text{ days (more men, less days)}$$

$$= \left(\frac{4 \times 550}{100}\right) \text{ days}$$

$$= 22 \text{ days}$$

Question 19.

Solution:

Clearly, less persons will consume the rice in more days.

And more persons will consume the rice in less days.

60 persons consume the bag of rice in 3 days.

1 person will consume the bag of rice in

(3 x 60) days (less persons, more days)

18 persons will consume the bag of rice

$$\text{in } \left(\frac{3 \times 60}{18}\right) \text{ days (more men, less days)}$$

$$= \left(\frac{180}{18}\right) \text{ days} = 10 \text{ days}$$

Ex 10D Solutions

OBJECTIVE QUESTIONS

Mark against the correct answer in each of the following :

Question 1

Solution:

(d) 92115

$$= \frac{92 \div 23}{115 \div 23} = \frac{4}{5} \text{ or } 4 : 5$$

Question 2.

Solution:

(a) 57x

= 5185

$$\Rightarrow \quad x = \frac{57 \times 85}{51} = 95$$

Question 3.

Solution:

(a) 2535

= 45x

$$\Rightarrow x = \frac{45 \times 35}{25} = 9 \times 7 = 63$$

Question 4.

Solution:

(c) 45

= x35

$$\Rightarrow x = \frac{4 \times 35}{5} = 28$$

Question 5.

Solution:

(b) ab

= cd

=>ad = bc

Question 6.

Solution:

(b) a : b :: b : c

$$\Rightarrow \frac{a}{b} = \frac{b}{c}$$

$$\Rightarrow b^2 = ac$$

Question 7.

Solution:

(b) 58 < 34 => 4 x 5 < 3 x 8 => 20 < 24

Question 8.

Solution:

Total amount = Rs 760

Ratio A : B = 8 : 11

$$\therefore \text{ B's share } = \frac{760\times11}{8+11} = \frac{760\times11}{19}$$

$$= \text{Rs. } 440 \qquad \text{(a)}$$

Question 9.

Solution:

(d) largest = 252×75+7

= 252×712

= 21 x 7

= 147

Question 10.

Solution:

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(b) largest = 90×51+3+5

= 90×59

= 50 cm

Question 11.

Solution:

(c) total strength of school

largest = 8405 x (12 + 5)

= 840×175

= 168 x 17

= 2856

Question 12.

Solution:

(b) Cost of 12 pens = Rs 138

Cost of 1 pen = Rs 138×1412

and cost of 14 pens = Rs 161

Question 13.

Solution:

(b) 24×158

= 45 days

Question 14.

Solution:

(a) 26×4020

= 52 men

Question 15.

Solution:

(b) In 6 L of petrol, a car covers = 111 km

In 1 L, it will cover = 1116 km

and in 10 L it will cover = 111×106 km

= 185 km

Question 16.

Solution:

(a) 28×550700

= 22 days

Question 17.

Solution:

Ratio in the angles of triangle

= 3 : 1 : 2

$$\text{Sum of angles of a triangle} = 180^\circ$$

$$\text{Largest angle} = \frac{180^\circ \times 3}{3+1+2} = \frac{180^\circ \times 3}{6}$$

$$= 90^\circ \qquad \text{(c)}$$

Question 18.

Solution:

(b) Ratio in length and breadth of a rectangle = 5 : 4

Width = 36 m

Length = 54 x 36 m

= 45m

Question 19.

Solution:

Bus covers in 3 hrs = 195 km

It will cover in 1 hr = 1953 = 65 km

Train cover in 4 hrs. = 300 km

It will cover in 1 hr. $= \frac{300}{4} = 75$ km

$\therefore$ Ratio in their speeds = 65 : 75

= 13 : 15 (a)

Question 20.

Solution:

1 dozen = 12 bars

Cost of 5 bars of soap = Rs.82.50

Then cost of 1 bar = Rs. $\frac{82.50}{5}$

and cost of 12 bars = Rs. $\frac{8250 \times 12}{100 \times 5}$

= Rs. 66 × 3 = Rs. 198 (c)

Question 21.

Solution:

Total pencils in 30 packets of 8 pencils

= 30 x 8= 240

and total pencils of 25 packets of 12

pencils = 25 x 12 = 300

Now cost of 240 pencils = Rs. 600

Then cost of 1 percent = Rs. 60024

and cost of 300 pencils = Rs. 600×300240

= Rs 750 (b)

Question 22.

Solution:

Journey of 75 km costs = Rs 215

Cost of 1 km = Rs 21575

and cost for 120 for = Rs. $\frac{215\times120}{75}$

= Rs. 344 (a)

Question 23.

Solution:

1st term = 12

2nd term = 21

fourth term = 14

Let third term = x, then

12 : 21 :: x : 14

$x = \frac{12\times14}{21} = 8$ (d)

Question 24.

Solution:

10 boys dig a patch in = 12 hrs

1 boy will dig it in = 12 x 10 hours

and 8 boys will dig it in $\frac{12\times10}{8}$

= 15 hours (b)

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He was born on January 2, 1946 in a village of Delhi. He graduated from Kirori Mal College, University of Delhi. After completing his M.Sc. in Mathematics in 1969, he joined N.A.S. College, Meerut, as a lecturer. In 1976, he was awarded a fellowship for 3 years and joined the University of Delhi for his Ph.D. Thereafter, he was promoted as a reader in N.A.S. College, Meerut. In 1999, he joined M.M.H. College, Ghaziabad, as a reader and took voluntary retirement in 2003. He has authored more than 75 titles ranging from Nursery to M. Sc. He has also written books for competitive examinations right from the clerical grade to the I.A.S. level.

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