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

Exercise 10A PAGE NO: 152

1.

Solution

(i) To convert given ratio a: b to its simplest form, we divide each term by the HCF of a and b

24: 56 = 24 / 56

= 24 ÷ 8 / 56 ÷ 8

= 3 / 7

Since the HCF of 3 and 7 is 1

∴ The simplest form of 24: 56 is 3: 7

(ii) To convert given ratio a: b to its simplest form, we divide each term by the HCF of a and b

84 paise to Rupees 3 = 0.84 to 3

= 0.84: 3

= 0.84 / 3

= 0.84 ÷ 3 / 3 ÷ 3

= 0.28 / 1

= 28 / 100

= 28 ÷ 4 /100 ÷ 4

= 7 / 25

Since the HCF of 7 and 25 is 1

∴ The simplest form of 0.84: 3 is 7: 25

(iii) To convert given ratio a: b to its simplest form, we divide each term by the HCF of a and b

4 kg to 750 g =4000 g to 750 g

= 4000: 750

= 4000 ÷ 250 / 750 ÷ 250

= 16 / 3

Since the HCF of 16 and 3 is 1

∴ The simplest form of 4000: 750 is 16: 3

(iv) To convert given ratio a: b to its simplest form, we divide each term by the HCF of a and b

1.8 kg to 6 kg = 1.8: 6

= 1.8 / 6

= 18 / 60

= 18 ÷ 6 / 60 ÷ 6

= 3 / 10

Since the HCF of 3 and 10 is 1

∴ The simplest form of 1.8: 6 is 3: 10

(v) To convert given ratio a: b to its simplest form, we divide each term by the HCF of a and b

48 minutes to 1 hour = 48 min : 60 min

= 48: 60

= 48 ÷ 12 / 60 ÷ 12

= 4 / 5

Since the HCF of 4 and 5 is 1

∴ The simplest form of 48: 60 is 4: 5

(vi) To convert given ratio a: b to its simplest form, we divide each term by the HCF of a and b

2.4 Km to 900 m = 2400 m : 900 m

= 2400 / 900

= 24 / 9

= 24 ÷ 3 / 9 ÷ 3

= 8 / 3

Since the HCF of 3 and 8 is 1

∴ The simplest form of 2400: 900 is 8: 3

2.

Solution

(i) HCF of 36 and 90 is 18

∴ 36: 90 = 36 / 90

= 36 ÷ 18 / 90 ÷ 18

= 2 / 5

= 2: 5

Hence, the simplest form of 36: 90 is 2: 5

(ii) HCF of 324 and 144 is 36

∴ 324: 144 = 324 / 144

= 324 ÷ 36 / 144 ÷ 36

= 9 / 4

Hence, the simplest form of 324: 144 is 9: 4

(iii) HCF of 85 and 561 is 17

∴ 85: 561 = 85 / 561

= 85 ÷ 17/ 561 ÷17

= 5 / 33

Hence, the simplest form of 85: 561 is 5: 33

(iv) HCF of 480 and 384 is 96

∴ 480: 384 = 480 / 384

= 480 ÷ 96 / 384 ÷ 96

= 5 / 4

Hence, the simplest form of 480: 384 is 5: 4

(v) HCF of 186 and 403 is 31

∴ 186: 403 = 186 / 403

= 186 ÷ 31 / 403 ÷ 31

= 6 / 13

Hence, the simplest form of 186: 403 is 6: 13

(vi) HCF of 777 and 1147 is 37

∴ 777: 1147 = 777 / 1147

= 777 ÷ 37 / 1147 ÷ 37

= 21 / 31

Hence, the simplest form of 777: 1147 is 21: 31

3.

Solution

(i) Rupees 6.30: Rupees 16.80

= 6. 30 / 16. 80

= 63 / 168

Since HCF of 63 and 168 is 21

= 63 ÷ 21 / 168 ÷ 21

= 3 / 8

∴ Simplest form of Rupees 6.30: Rupees 168 is 3: 8

(ii) 3 weeks : 30 days = 21 days: 30 days

= 21: 30

= 21 / 30

Since HCF of 21 and 30 is 3

= 21 ÷ 3 / 30 ÷ 3

= 7 / 10

∴ Simplest form of 21: 30 is 7:10

(iii) 3 m 5 cm : 35 cm = 300 cm 5 cm : 35 cm [1m = 100 cm]

= 305 cm: 35 cm

= 305: 35

= 305 / 35

Since, HCF of 305 and 35 is 5

= 305 ÷ 5 / 35 ÷ 5

= 61 / 7

∴ Simplest form of 305: 35 is 61: 7

(iv) 48 min : 2 hrs 40 min = 48 min : 120 min 40 min [1 hour = 60 minutes]

= 48 min : 160 min

= 48: 160

= 48 / 160

Since, HCF of 48 and 160 is 16

= 48 ÷ 16 / 160 ÷ 16

= 3 / 10

∴ Simplest form of of 48:160 is 3: 10

(v) 1 L 35 ml: 270 ml = 1035 ml: 270 ml [1 L = 1000 ml]

= 1035: 270

= 1035 / 270

Since, HCF of 1035 and 270 is 45

= 1035 ÷ 45 / 270 ÷ 45

= 23 / 6

∴ Simplest form of 1035: 270 is 23: 6

(vi) 4 kg: 2 kg 500g = 4000g: 2500 g [1 kg = 1000 g]

= 4000 / 2500

= 40 / 25

Since, HCF of 40 and 25 is 5

= 40 ÷ 5 / 25 ÷ 5

= 8 / 5

∴ Simplest form of 4000:2500 is 8: 5

4.

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Solution

Mr Sahai's earning = 16,800

And, Mrs Sahai's earning = 10,500

(i) 16,800 : 10,500 = 168: 105

= 168 / 105

Since, HCF of 168 and 105 is 21

= 168 ÷ 21 / 105 ÷ 21

= 8 / 5

= 8: 5

(ii) 10,500: 16,800 = 105: 168

= 105 / 168

Since, HCF of 105 and 168 is 21

= 105 ÷ 21 / 168 ÷ 21

= 5 / 8

= 5: 8

(iii) Total income of the two = 16,800 + 10,500

= 27,300

16,800: 27,300 = 168: 273

= 168 / 273

Since, HCF of 168 and 273 is 21

= 168 ÷ 21 / 273 ÷ 21

= 8 / 13

= 8: 13

5.

Rohit's income = 15,300

Rohit's saving = 1,224

(i) 15,300: 1,224 = 15,300 / 1,224

HCF of 15,300 and 1,224 is 612

= 15,300 ÷ 612 / 1,224 ÷ 612

= 25 / 2

Income: saving = 25: 2

Monthly expenditure = (15300 – 1224)

= 14076

(ii) 15,300: 14076 = 15,300 / 14076

HCF of 15,300 and 14076 is 612

= 15,300 ÷ 612 / 14076 ÷ 612

= 25 / 23

= 25: 23

Income: Expenditure = 25: 23

(iii) 14,076: 1,224 = 14,076 / 1,224

HCF of 14,076 and 1,224 is 612

= 14,076 ÷ 612 / 1,224 ÷ 612

= 23 / 2

Expenditure: Saving = 23: 2

6.

Solution

Given,

Number of male: Number of female = 5: 3

Let x be the number

Number of male = 5x

Number of female = 3x

Given number of male = 115

5x = 115

x = 115 / 5

x = 23

Number of female workers = 3x

= 3 × 23

= 69

∴ there are 69 female workers in the mill

7.

Solution

Given

Number of boys: number of girls = 9: 5

Let number of boys be 9x

Number of girls be 5x

Total strength = 448

According to the question we have,

9x + 5x = 448

14x = 448

x = 448 / 14

= 32

Number of boys = 9x = 9 × 32

= 288

Number of girls = 5x = 5 × 32

= 160

∴ Number of girls are 160

8.

Solution

Given

Kamal: Madhu = 7: 2

Sum of ratios = 7 + 2 = 9

Kamal's share = 7 / 9 × 1,575 = 11025 / 9

= Rupees 1,225

Madhu's share = 2 / 9 × 1,575 = 3150 / 9

= Rupees 350

9.

Solution

Given A: B: C = 3: 5: 7

Sum of the ratios = 3 + 5 + 7

= 15

Share of A = 3 / 15 × 3,450

= 10,350 / 15

= Rupees 690

Share of B = 5 / 15 × 3,450

= 17,250 / 15

= Rupees 1,150

Share of C = 7 / 15 × 3,450

= 24,150 / 15

= Rupees 1,610

10.

Solution

Given

Two numbers are in the ratio = 11: 12

Let x be the number

According to the question = 11x + 12x = 460

23x = 460

x = 460 / 23

x = 20

11x = 11 × 20 = 220

12x = 12 × 20 = 240

Hence, 220 and 240 are the numbers in the ratio 11: 12 and their sum is 460

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Exercise 10B

1.

Solutions

(i) Given 4, 6, 8, 12

We have: 4: 6

= 4 / 6

= (4 ÷ 2) / (6 ÷ 2)

= 2 / 3

8: 12

= 8 / 12

= (8 ÷ 4) / (12 ÷ 4)

= 2 / 3

∴ 4: 6 = 8: 12

Hence, 4, 6, 8, 12 are in proportion.

(ii) Given 7, 42, 13, 78

We have: 7: 42

= 7 / 42

= (7 ÷ 7) / (42 ÷ 7)

= 1 / 6

13: 78

= 13 / 78

= (13 ÷ 13) / (78 ÷ 13)

= 1 / 6

∴ 7: 42 = 13: 78

Hence, 7, 42, 13, 78 are in proportion.

(iii) Given 33, 121, 9, 96

We have: 33: 121

= 33 / 121

= (33 ÷ 11) / (121 ÷ 11)

= 3 / 11

9: 96

= 9 / 96

= (9 ÷ 3) / (96 ÷ 3)

= 3 / 32

∴ 33: 121 ≠ 9: 96

Hence, 33, 121, 9, 96 are not in proportion.

(iv) Given 22, 33, 42, 63

We have: 22: 33

= 22 / 33

= (22 ÷ 11) / (33 ÷ 11)

= 2 / 3

42: 63

= 42 / 63

= (42 ÷ 21) / (63 ÷ 21)

= 2 / 3

∴ 22:33 = 42: 63

Hence, 22, 33, 42, 63 are in proportion.

(v) Given 32, 48, 70, 210

We have: 32: 48

= 32 / 48

= (32 ÷ 6) / (48 ÷ 6)

= (16 / 3) / 8

= 2 / 3

70: 210

= 70 / 210

= 1 / 3

∴ 32: 48 ≠ 70: 210

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

(vi) Given 150, 200, 250, 300

We have: 150: 200

= 150 / 200

= (150 ÷ 50) / (200 ÷ 50)

= 3 / 4

250: 300

= 250 / 300

= (250 ÷ 50) / (300 ÷ 50)

= 5 / 6

∴ 150: 200 ≠ 250: 300

Hence, 150, 200, 250, 300 are not in proportion.

2.

Solutions

(i) In 60 : 105 : : 84 : 147

We have:

Product of extremes = (60 × 147) = 8820

Product of means = (105 × 84) = 8820

∴ product of extremes = product of means

(ii) In 91 : 104 : : 119 : 136

We have:

Product of extremes = (91 × 136) = 12376

Product of means = (104 × 119) =12376

∴ product of extremes = product of means.

(iii) In 108 : 72 : : 129 : 86

We have:

Product of extremes = (108 × 86) = 9288

Product of means = (72 × 129) = 9288

∴ product of extremes = product of means.

(iv) In 39 : 65 : : 141 : 235

We have:

Product of extremes = (39 × 235) = 9165

Product of means = (65 × 141) = 9165

∴ product of extremes = product of means.

3.

Solutions

(i) Clearly, product of means = product of extremes.

∴ 11 × x = 55 × 6

x = (55 × 6) / 11

= 330 / 11

= 30

∴ x = 30

(ii) Clearly, product of means = product of extremes.

∴ x × 63 = 27 × 84

63x = 27 × 84

x = (27 × 84) / 63

x = 2268 / 63

= 36

∴ x = 36

(iii) Clearly, product of means = product of extremes.

∴ 85 × 57 = 51 × x

51x = 85 × 57

x = (85 × 57) / 51

x = 4845 / 51

x = 95

∴ x = 95

(iv) Clearly, product of means = product of extremes.

∴ 92 × 87 = x × 116

116 × x = 92 × 87

116x = 92 × 87

116x = 8004

x = 8004 / 116

= 69

∴ x = 69

4.

Solutions

(i) In 51 : 68 : : 85 : 102

Product of extremes = (51 × 102) = 5202

Product of means = (68 × 85) = 5780

∴ Product if extremes ≠ product of means

Hence, false

(ii) In 36: 45:: 80 : 100

Product of extremes = (36 × 100) = 3600

Product of means = (45 × 80) = 3600

∴ Product of extremes = product of means

Hence, true

(iii) In 30 bags: 18 bags:: Rupees 450 : Rupees 270

Product of extremes = (30 × 270) = 8100

Product of means = (18 × 450) = 8100

∴ Product of extremes = product of means

Hence, true

(iv) In 81 Kg : 45 Kg : : 18 men : 10 men

Product of extremes = (81 × 10) = 810

Product of means = (45 × 18) = 810

∴ Product of extremes = product of means

Hence, true

(v) In 45 Km : 60 Km : : 12 h : 15 h

Product of extremes = (45 × 15) = 675

Product of means = (60 × 12) = 720

∴ Product if extremes ≠ product of means

Hence, false

(vi) In 32 Kg : Rupees 36 : : 8 Kg : Rupees 9

Product of extremes = (32 × 9) = 288

Product of means = (36 × 8) = 288

∴ Product of extremes = product of means

Hence, true

5.

Solutions

(i) We have:

25 cm : 1 m = 25 / 100 [1m = 100 cm]

= (25 ÷ 25) / (100 ÷ 25)

= 1 / 4

Rupees 40 : Rupees 160 = 40 / 160

= (40 ÷ 40) / (160 ÷ 40)

= 1 / 4

Hence, 25 cm : 1m and Rupees 40 : Rupees 160 are in proportion.

(ii) We have:

39 litres : 65 litres = 39 / 65

= (39 ÷ 13) / (65 ÷ 13)

= 3 / 5

6 bottles : 10 bottles = 6 / 10

= 3 / 5

Hence, 39 litres : 65 litres and 6 bottles : 10 bottles are in proportion

(iii) We have:

200 mL : 2.5 L = 200 mL : 2500 mL [1 L = 1000 mL]

= 200 / 2500

= 2 / 25

Rupees 4 : Rupees 50 = 4 / 50

= (4 ÷2) / (50 ÷2)

= 2 / 25

Hence, 200 mL : 2.5 L and Rupees 4 : Rupees 50 are in proportion

(iv) We have:

2 Kg : 80 Kg = 2 / 80

= 1 / 40

25 g : 625 Kg = 25 / 625000 [1 Kg = 1000 g]

= (25 ÷ 25) / (625000 ÷ 25)

= 1 / 25000

Hence, 2 Kg : 80 Kg and 25 g : 625 Kg are not in proportion.

6.

Solution

Given first term = 51

Second term = 68

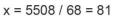fourth term = 108

Let the third term be x

51 : 68 : : x : 108

We know that

Product of extremes = product of means

(51 × 108) = (68 × x)

(68 × x) = (51 × 108)

68x = 5508

x = 5508 / 68 = 81

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Exercise 10C.   PAGE NO: 157

1.

Solution

Given the cost of 14 m cloth = Rupees 1890

Cost of 1 m cloth will be = 1890 / 14

= 135

Cost of 6 m cloth = 135 × 6

= 810

Hence, the cost of 6 m cloth = Rupees 810

2.

Solution

Given cost of a dozen soaps = Rupees 285.60

Cost of 1 soap = 285.60 / 12

= 23.80

Cost of 1 soap = Rupees 23.80

Cost of 15 soaps = 23.80 × 15

= 357

Cost of 15 soaps = Rupees 357

3.

Solution

Given cost of 9 kg = Rupees 327.60

Cost of 1 Kg = 327.60 / 9

= 36.4

Cost of 1 Kg = Rupees 36.4

Cost of 50 Kg of rice = 36.4 × 50

= 1820

Cost of 50 Kg of rice = Rupees 1820

4.

Solution

Given Uniform iron rod of 22.5 m weighs = 85.5 Kg

Weight of 1 m rod will be = 85.5 / 22.5

= 3.8 Kg

Weight of 5 m rod will be = 3.8 × 5

= 19 Kg

Weight of 5 m rod = 19 Kg

5.

Solution

Given 15 tins contain 234 Kg of oil of same size

1 tin contain = 234 / 15

= 15.6 Kg oil

10 tins = 15 .6 × 10

= 156 Kg of oil

10 tins contain 156 Kg of oil

6.

Solution

Given12 L of diesel is consumed by a car in covering a distance of 222 Km

For 1 L diesel consumed by a car = 222 / 12

= 18.5 Km

So, for 22 L diesel = 18.5 × 22

= 407 Km

Distance covered by a car in 22 L diesel is 407 Km

7.

Solution

Given, for 25 tonnes of weight, transport charges = 540

For 1 tonnes of weight it charges = 540 / 25

= 21.6

Company charges rupees 21.6 to carry 1 tonnes of weight

To carry 35 tonnes of weight it charges = 21.6 × 35

= 756

Hence company charges rupees 756 to carry 35 tonnes of weight.

8.

Solution

Given 4.5 g of an alloy of copper and zinc contains 3.5 g of copper

For 1 g of an alloy will contain = 3.5 / 4.5

= 0.777 g of copper

1 g of an alloy will contain 0.777 g of copper

For 18.9 g of an alloy contain = 0.777 × 18.9

= 14.7 g of copper

Hence, 18.9 g of an alloy contain 14.7 g of copper

9.

Solution

Given 35 inland letters costs rupees 87.50

So, for rupees 1 we can buy = 35 / 87.50

= 0.4 inland letters

To buy for rupees 315 = 0.4 × 315

= 126 letters

Hence, we can buy 126 inland letters for rupees 315

10.

Solution

Given 4 dozen bananas cost = rupees 104

4 dozen = 48 bananas

For 1 rupees we can buy = 48 / 104

= 0.46 bananas

To buy for rupees 6.50 = 0.46 × 6.50

= 2.9 or 3 bananas

Hence, we can buy 3 bananas for rupees 6.50

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Exercise 10D.   **PAGE NO: 157**

1.

Solution

Since HCF of 92 and 115 is 23

92 : 115 = (92 ÷ 23) / (115 ÷ 23)

= 4 / 5

= 4 : 5

Option (d) is the correct answer

2.

Solution

57 : x : : 51 : 85

57 / x = 51 / 85

51x = (57 × 85)

x = (57 × 85) / 51

x = 4845 / 51

x = 95

Option (a) is the correct answer

3.

Solution

25 : 35 : : 45 : x

25 / 35 = 45 / x

25x = 35 × 45

x = (35 × 45) / 25

x = 1575 / 25

x = 63

Option (a) is the correct answer

4.

Solution

4 : 5 : : x : 35

4 / 5 = x / 35

5x = 4 × 35

x = (4 × 35) / 5

x = 140 / 5

x = 28

Option (c) is the correct answer

5.

Solution

a : b : : c : d

a / b = c / d

ad = bc

Option (b) is the correct answer

6.

Solution

a : b : : b : c

Since product of extremes = product of means

Hence, b^2 = ac

Option (b) is the correct answer

7.

Solution

We know that

5 : 8 = 5 / 8 and

3 : 4 = 3 / 4

(3 × 2) / (4 × 2) = 6 / 8 [making the denominator same]

Since, 6 > 5

Hence (5 : 8) < (3 : 4)

Option (b) is the correct answer.

8.

Solution

A : B = 8 : 11

Sum of ratio terms = 8 + 11

= 19

B's share = 11 / 19 × 760

= 8360 / 19

=440

Option (a) is the correct answer

9.

Solution

Given ratio 5 : 7

Let x be the number

5x + 7x = 252

12x = 252

x = 252 / 12

x = 21

5x = 5 × 21 = 105

7x = 7 × 21 =147

Option (d) is the correct answer.

10.

Solution

Given the sides of the triangle are in the ratio 1 : 3 : 5

Let x be any number such that 1x cm, 3x cm and 5x cm

1x + 3x + 5x = 90

9x = 90

x = 90 / 9

x = 10

1x = 1 × 10 = 10 cm

3x = 3 × 10 = 30 cm

5x = 5 × 10 = 50 cm

Option (b) is the correct answer.

11.

(a) 1,190

(b) 2,380

(c) 2,856

(d) 2,142

Solution

Given ratio of boys and girls = 12 : 5

Let x be the number such that number of boys and girls be 12x and 5x respectively

Given 5x = 840

x = 840 / 5

x = 168

Number of girls = 840

Number of boys = 12x = 12 × 168

= 2016

Total strength of school = 2016 + 840

= 2856

Option (c) is the correct answer

12.

Solution

Given cost of 12 pens = 138

Cost of 1 pen will be = 138 / 12 = rupees 11.5

Cost of 14 pens will be = 11.5 × 14 = rupees 161

Option (b) is the correct answer