

CBSE NCERT Solutions for Class 6 mathematics Chapter 12

Exercise 12.1

- Q.1. There are 20 girls and 15 boys in a class.
What is the ratio of the number of girls to the number of boys.

Solution: Given, Total number of girls = 20.
Total number of boys = 15.
Total number of students = Total number of girls + Total number of boys
= 20 + 15 = 35.
The ratio of girls to that of boys = $\frac{\text{Total number of girls}}{\text{Total number of boys}}$
= $\frac{20}{15}$
= $\frac{4}{3}$
Hence, the required ratio is 4:3.

- Q.2. There are 20 girls and 15 boys in a class.
What is the ratio of the number of girls to the total number of students in the class.

Solution: Given, Total number of girls = 20.
Total number of boys = 15.
Total number of students = Total number of girls + Total number of boys
= 20 + 15 = 35.
The ratio of girls to total students = $\frac{\text{Total number of girls}}{\text{Total number of students}}$
= $\frac{20}{20+15}$
= $\frac{20}{35}$
= $\frac{4}{7}$
Therefore, the required ratio is 4:7.

- Q.3. In a college, out of 4320 students, 2300 are girls. Find the ratio of
Number of girls to the total number of students.
115:216

Solution: Given, total number of students = 4320
Number of girls = 2300
Ratio of girls to total number of students = $\frac{\text{Total number of girls}}{\text{Total number of students}}$
= $\frac{2300}{4320}$
After simplifying above fraction we get the required ratio.
= $\frac{115}{216}$
= 115:216
Therefore, the required ratio is 115:216.

- Q.4. In a college, out of 4320 students, 2300 are girls.
Find the ratio of number of boys to the number of girls.
101:115

Solution: Given, total number of students = 4320
Number of girls = 2300
Therefore, number for boys = Total number of students - Number of girls
= 4320 - 2300
= 2020
Ratio of number of boys to that of girls = $\frac{\text{Total number of boys}}{\text{Total number of girls}}$
= $\frac{2020}{2300}$
After making an equivalent fraction of above fraction we get the required fraction.
= $\frac{101}{115}$
= 101:115
Therefore, the required ratio is 101:115.

- Q.5. In a college, out of 4320 students, 2300 are girls.
Find the ratio of number of boys to the total number of students.
101:216

Solution: Given, total number of students = 4320
 Number of girls = 2300
 Therefore, number for boys
 = 4320 - 2300
 = 2020

Ratio of boys to total number of students = $\frac{\text{Total number of boys}}{\text{Total number of students}}$
 = $\frac{2020}{4320}$
 = $\frac{101}{216}$
 = 101:216
 Hence, the required ratio is 101:216.

Q.6. Out of 1800 students in a school, 750 opted basketball, 800 opted cricket and remaining opted table tennis. If a student can opt only one game, find the ratio of number of students who opted basketball to the number of students who opted table tennis.

3:1

Solution: Given, total number of students = 1800
 Number of students opted basketball = 750
 Number of students opted cricket = 800
 Therefore, number of students opted table tennis = Total number of students - (Number of students opted basketball + Number of students opted cricket)
 = 1800 - 750 + 800 = 250

Ratio of students opted basketball to that of opted table tennis
 = $\frac{\text{Number of students opted basketball}}{\text{Number of students opted table tennis}}$
 = $\frac{750}{250} = 3:1$
 = 3:1
 Hence, the required ratio is 3:1.

Q.7. Out of 1800 students in a school, 750 opted basket ball, 800 opted cricket and remaining opted table tennis. If a student can opt only one game, find the ratio of number of students who opted cricket to the number of students opting basketball.

16:15

Solution: Given, total number of students = 1800
 Number of students opted basketball = 750
 Number of students opted cricket = 800

Ratio of students opted cricket to students opted basketball
 = $\frac{\text{Number of students opted cricket}}{\text{Number of students opted basketball}}$
 = $\frac{800}{750}$
 = $\frac{16}{15}$
 = 16:15
 Therefore, the required ratio is 16:15.

Q.8. Out of 1800 students in a school, 750 opted basketball, 800 opted cricket and remaining opted table tennis. If a student can opt only one game, find the ratio of number of students who opted basketball to the total number of students.

5:12

Solution: Given, total number of students = 1800
 Number of students opted basketball = 750
 Number of students opted cricket = 800
 Ratio of students opted basketball to total number of students
 = $\frac{\text{Number of students opted basketball}}{\text{Total number of students}}$
 = $\frac{750}{1800}$
 = $\frac{5}{12}$
 = 5:12
 Thus, the required ratio is 5:12.

Q.9. Cost of a dozen pens is ₹180 and cost of 8 ball pens is ₹56. Find the ratio of the cost of a pen to the cost of a ball pen.

15:7

Solution: Given cost of a dozen pens = ₹180
 \therefore Cost of 1 pen = $\frac{180}{12}$ = ₹15
 Given cost of 8 ball pens = ₹56
 \therefore Cost of 1 ball pen = $\frac{56}{8}$ = ₹7

Ratio of cost of one pen to that of one ball pen = $\frac{\text{Cost of a pen}}{\text{Cost of a ball pen}}$
 $= \frac{15}{7}$
 $= 15:7$
 Hence, the required ratio is 15:7.

Q.10. Consider the statement: Ratio of breadth and length of a hall is 2:5. Complete the following table that shows some possible breadths and lengths of the hall.

Breadth of hall (in meters)	10		40
Length of the hall (in meters)	25	50	

Solution: Given,
 Ratio of breadth to length = 2:5 = 25
 \therefore Other equivalent ratios are = $25 \times 5 = 1025$ = $25 \times 10 = 250$ = $25 \times 20 = 500$ = $25 \times 40 = 1000$

Comparing the equivalent ratios we have,
 Hence,

Breadth of hall (in meters)	10	20	40
Length of the hall (in meters)	25	50	100

Q.11. Divide 20 pens between Sheela and Sangeeta in the ratio of 3:2.

Solution: Given, Ratio between Sheela and Sangeeta = 3:2
 Total number of pens = 20
 Total parts of ratio = 3+2=5
 Number of pens each person should get = $\frac{\text{Ratio of pens belongs to that person}}{\text{Total parts of ratio}} \times \text{Total pens}$
 Therefore, the number of pens Sheela should get = $\frac{3}{5} \times 20 = 12$
 The number of pens Sangeeta should get = $\frac{2}{5} \times 20 = 8$
 Hence, Sheela 12 pens and Sangeeta gets 8 pens respectively.

Q.12. Mother wants to divide ₹36 between her daughters Shreya and Bhoomika in the ratio of their ages. If age of Shreya is 15 years and age of Bhoomika is 12 years, find how much Shreya and Bhoomika will get.

Solution: Given,
 Age of Shreya = 15 years
 Age of Bhoomika = 12 years
 Ratio of the age of Shreya to that of Bhoomika = $\frac{\text{Age of Shreya}}{\text{Age of bhoomika}}$
 $= \frac{15}{12} = \frac{5}{4}$
 $= 5:4$
 Hence, the required ratio is 5:4

Thus, ₹36 to be divided between Shreya and Bhoomika in the ratio of 5:4.
 \therefore Total parts = 5+4=9

Amount of money each person get = $\frac{\text{Ratio of money that person get}}{\text{Total parts}} \times \text{Total amount of money}$
 Amount of money Shreya gets = $\frac{5}{9} \times 36 = 20$
 Amount of money Bhoomika gets = $\frac{4}{9} \times 36 = 16$
 Therefore, amount of money Shreya get ₹20 and Bhoomika get ₹16 respectively.

Q.13. Present age of father is 42 years and that of his son is 14 years. Find the ratio of present age of father to the present age of son.
 3:1

Solution: Given,
 Age of father = 42 years
 Age of son = 14 years
 Ratio of father's present age to that of son = $\frac{\text{Age of father}}{\text{Age of son}} = \frac{42}{14} = \frac{3}{1}$
 Hence, the required ratio is 3:1.

- Q.14. Present age of father is 42 years and that of his son is 14 years.
Find the ratio of age of the father to the age of son, when son was 12 years old in the simplest fraction form.

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Solution: When the son was 12 years, i.e., 2 years ago,
then father age was $42-2=40$ years
Therefore, the ratio of their ages = $\frac{\text{Age of father two years ago}}{\text{Age of son two years ago}}$
 $=\frac{40}{12}$
 $=\frac{10}{3}$
Hence, the required ratio is $\frac{10}{3}$.

- Q.15. Present age of father is 42 years and that of his son is 14 years. Find the ratio of
Age of father after 10 years to the age of son after 10 years in simplest fraction form.

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Solution: Age of father after 10 years = Present age + 10
 $=42+10=52$ years
Age of son after 10 years = Present age + 10
 $=14+10=24$ years
Therefore, ratio of their ages of ages after 10 years = $\frac{\text{Age of father after ten years}}{\text{Age of son after ten years}}$
 $=\frac{52}{24}$
 $=\frac{13}{6}$
Hence, the required ratio is $\frac{13}{6}$.

- Q.16. Present age of father is 42 years and that of his son is 14 years.
Find the ratio of age of father to the age of son when father was 30 years old in the simplest fraction form.

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Solution: Given: Present age of father is 42 years and that of his son is 14 years.
When father was 30 years old,
i.e., 12 years ago, then son age was $=14-12=2$ years.
Therefore, the ratio of their ages = $\frac{\text{Age of father twelve years ago}}{\text{Age of son twelve years ago}}$
 $=\frac{30}{2}$
 $=15/1$
Hence, the required ratio is 15:1

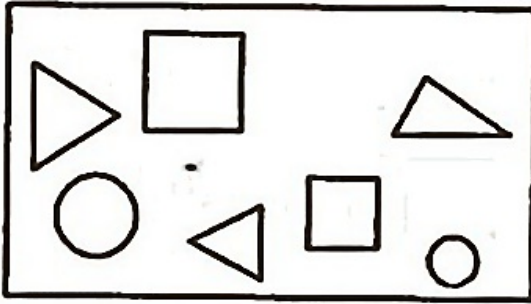
- Q.17. Out of 30 students in a class, 6 like football, 12 like cricket and remaining like tennis. Find the ratio of number of students liking football to number of students liking tennis.

Solution: Given, total number of students = 30.
Total number of students like football = 6.
Total number of students like cricket = 12. Number of students like tennis = Total number of students - Number of students like football - Number of students like cricket. Number of students like tennis = $30-6-12=12$ The ratio of students like football that of tennis = $\frac{\text{Number of students like football}}{\text{Number of students like tennis}}$
 $=\frac{6}{12}=\frac{1}{2}$ Therefore, the required ratio is 1:2

- Q.18. Out of 30 students in a class, 6 like football, 12 like cricket and remaining like tennis. Find the ratio of Number of students liking cricket to the total number of students.

Solution: Given, Total number of students = 30.
Total number of students who like football = 6.
Total number of students who like cricket = 12.
Number of students who like tennis = Total number of students - Number of students who like football - Number of students who like cricket.
Number of students who like tennis = $30-6-12=12$.
Therefore, The ratio of students who like cricket to that of total students
 $=\frac{\text{Number of students who like cricket}}{\text{Total number of students}}$
 $=\frac{12}{30}$
 $=\frac{2}{5}$
Hence, the required ratio is 2:5.

Q.19. See the figure and find the ratio of



Number of triangles to the number of circles inside the rectangle.

Solution:

From the given figure,

Total number of triangles = 3.

Total number of squares = 2.

Total number of circles = 2.

Total number of figures = 7.

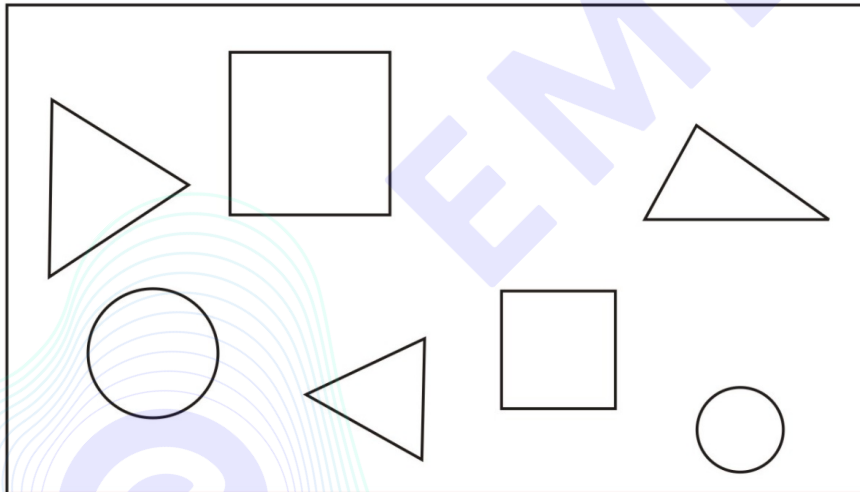
Ratio of number of triangles to that of circles = $\frac{\text{Total number of triangles}}{\text{Total number of circles}}$

$= \frac{3}{2}$

$= 3:2$

Hence, the required ratio is 3:2.

Q.20. See the figure and find the ratio of number of squares to all the figures inside the rectangle.



Solution:

From the given figure,

Total number of triangles = 3.

Total number of squares = 2.

Total number of circles = 2.

Total number of figures = 7.

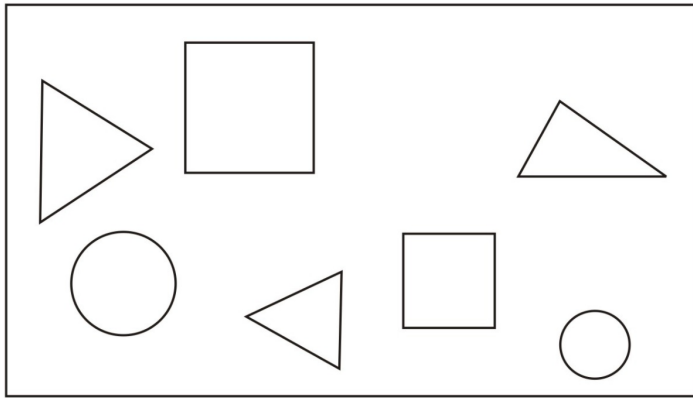
Ratio of number of squares to all figures = $\frac{\text{Total number of squares}}{\text{Total number of figures}}$

$= \frac{2}{7}$

$= 2:7$

Hence, the required ratio is 2:7.

Q.21. See the figure and find the ratio of the number of circles to all the figures inside the rectangle.



Solution:

From the given figure,

Total number of triangles = 3.

Total number of squares = 2. Total number of circles = 2. Total number of figures = 7. Ratio of number of circles to all figures = $\frac{\text{Total number of circles}}{\text{Total number of figures}} = \frac{2}{7}$ Therefore, the required ratio is 2:7

Q.22. Distances travelled by Hamid and Akhtar in an hour are 9 km and 12 km. Find the ratio of speed of Hamid to the speed of Akhtar.

Solution:

We know that,
 $\text{Speed} = \frac{\text{Distance}}{\text{Time}}$
 Speed of Hamid = $\frac{9 \text{ km}}{1 \text{ h}}$
 = 9 km/h
 Speed of Akhtar = $\frac{12 \text{ km}}{1 \text{ h}}$
 = 12 km/h

Ratio of speed of Hamid to that of speed of Akhtar = $\frac{\text{Speed of Hamid}}{\text{Speed of Akhtar}}$
 = $\frac{9}{12}$
 = $\frac{3}{4}$

= 3:4
 Therefore, the required ratio is 3:4.

Q.23. $15:18 = \frac{\quad}{\quad} : 6 = 10 : \frac{\quad}{\quad} = \frac{\quad}{\quad} : 30$
 [Are these equivalent ratios?]

5

Solution: Given 15:18

$$15:18 = 5 \times 3 : 6 \times 3$$

Divide both the numerator and denominator by the same number.

$$= 5:6$$

Hence, the required answer in the first blank is 5. Given: $15:18 = 5 \times 3 : 6 \times 3$

$$= 5:6$$

$$\therefore 5:6 = 5 \times 2 : 6 \times 2$$

$$= 10:12$$

Hence, answer in second blank is 12. $15:18 = 5 \times 3 : 6 \times 3 = 5:6 \therefore 5:6 = 5 \times 5 : 6 \times 5 = 25:30$ Hence, the required answer in the third blank is 25. $15:18 = 5:6 = 10:12 = 25:30$ Since, all the ratios are same. Yes, these are equivalent ratios.

12

Solution: Given 1518

$$1518 = 5 \times 36 \times 3$$

Divide both the numerator and denominator by the same number.

$$= 56$$

Hence, the required answer in the first blank is 5. Given: $1518 = 5 \times 36 \times 3$

$$= 56$$

$$\therefore 56 = 5 \times 26 \times 2$$

$$= 1012$$

Hence, answer in second blank is 12. $1518 = 5 \times 36 \times 3 = 56$. $\therefore 56 = 5 \times 56 \times 5 = 2530$ Hence, the required answer in the third blank is 25. $1518 = 56 = 1012 = 2530$ Since, all the ratios are same. Yes, these are equivalent ratios.

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Solution: Given 1518

$$1518 = 5 \times 36 \times 3$$

Divide both the numerator and denominator by the same number.

$$= 56$$

Hence, the required answer in the first blank is 5.

Given: 1518

$$1518 = 5 \times 36 \times 3$$

$$= 56$$

$$\therefore 56 = 5 \times 26 \times 2$$

$$= 1012$$

Hence, answer in second blank is 12.

$$1518 = 5 \times 36 \times 3 = 56$$

$$\therefore 56 = 5 \times 56 \times 5 = 2530$$

Hence, the required answer in the third blank is 25. $1518 = 56 = 1012 = 2530$ Since, all the ratios are same. Yes, these are equivalent ratios.

Q.24. Find the ratio of the following: 81 to 108

Solution: To calculate the ratio of any number we divide the given numbers to each other.

Let A & B are the two numbers then the ratio of A to B = AB

Here, A=81 & B=108, Now the ratio of 81 to 108 = $\frac{81}{108} = \frac{34}{34} = 3:4$ Hence, the required ratio is 3:4

Q.25. Find the ratio of the following: 98 to 63

Solution: To calculate the ratio of any number we divide the given numbers to each other.

Let A & B are the two numbers then the ratio of A to B = AB

Here, A=98 & B=63, Now the ratio of 98 to 63 = $\frac{9863}{63} = 149 = 14:9$ Hence, the required ratio is 14:9.

Q.26. Find the ratio of the following
33 km to 121 km

Solution: Ratio of A to B = AB

Ratio of 33 km to 121 km = $\frac{33}{121}$

= $\frac{311}{311} = 3:11$ Thus, the required ratio is 3:11.

Q.27. Find the ratio of the following
30 minutes to 45 minutes

Solution: Ratio of A to B = $\frac{A}{B}$
 Ratio of 30 minutes to 45 minutes = $\frac{30 \text{ minutes}}{45 \text{ minutes}} = \frac{30}{45}$
 $= \frac{2}{3}$
 $= 2:3$
 Hence, the required ratio is 2:3.

Q.28. Find the ratio of the following

30 minutes to 1.5 hours

Solution: Ratio of A to B = $\frac{A}{B}$
 We know that, 1 hour = 60 minutes.
 1.5 hours = $1.5 \times 60 = 90$ minutes.
 Ratio of 30 minutes to 1.5 hour = $\frac{30 \text{ minutes}}{90 \text{ minutes}} = \frac{30}{90}$
 $= \frac{1}{3}$
 $= 1:3$
 Hence, the required ratio is 1:3.

Q.29. Find the ratio of the following

40 cm to 1.5 m

4:15

Solution: Given numbers are: 4 cm and 1.5 m.
 Now, 1.5 m = $1.5 \times 100 = 150$ cm.
 So,
 Ratio of 40 cm and 1.5 m = $\frac{40}{150} = \frac{4}{15}$.
 Hence, the required ratio is 4:15.

Q.30. Find the ratio of the following: 55 paise to ₹1.

Solution: If A & B are two numbers, then the ratio of A to B = $\frac{A}{B} = A:B$
 We know that ₹1 = 100 paise
 Here, A = 55 & B = 100, Now, the ratio of 55 to 100 = $\frac{55}{100} = \frac{11}{20} = 11:20$ Hence, the required ratio is 11:20

Q.31. Find the ratio of the following

500ml to 2 litres

Solution: Ratio of A to B = $\frac{A}{B}$
 We know that 1 liter = 1000 ml.
 2 liters = $2 \times 1000 \text{ ml} = 2000 \text{ ml}$
 500 ml : 2 litres = $500 \text{ ml} : 2000 \text{ ml} = \frac{500}{2000}$
 $= \frac{1}{4}$
 $= 1:4$
 Hence, the required ratio is 1:4.

Q.32. In a year, Seema earns ₹1,50,000 and saves ₹50,000. Find the ratio of Money that Seema earns to the money she saves.

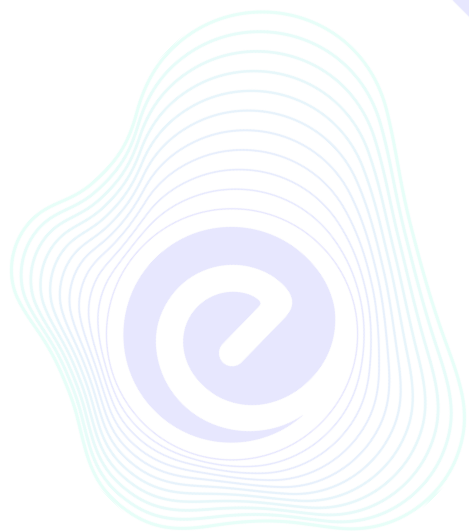
Solution: Given, Total earning = ₹1,50,000
 Money saved = ₹50,000.
 \therefore Money spent = ₹1,50,000 - ₹50,000
 $= ₹1,00,000$
 Ratio of money earned to money saved = $\frac{\text{Total earned}}{\text{Money saved}}$
 $= \frac{150000}{50000} = 3:1$
 $= 3:1$
 Therefore, the required ratio is 3:1.

Q.33. In a year, Seema earns ₹1,50,000 and saves ₹50,000. Find the ratio of Money that she saves to the money she spends.

Solution: Given, Total earning = ₹1,50,000
Money saved = ₹50,000. Money spent = Money earned - Money saved
Hence, Money spent = ₹1,50,000 - ₹50,000 = ₹1,00,000
Ratio of money saved to money spent = $\frac{\text{Money saved}}{\text{Money spent}}$
= $\frac{50000}{100000} = \frac{1}{2}$
= 1:2
Therefore, the required ratio is 1:2.

Q.34. There are 102 teachers in a school of 3300 students. Find the ratio of the number of teachers to the number of students.

Solution: Given, Total number of students = 3300
Total number of teachers = 102
Ratio of number of teachers to that of students = $\frac{\text{Number of teachers}}{\text{Number of students}}$
= $\frac{102}{3300}$
= $\frac{17}{550}$
= 17:550
Hence, the required ratio is 17:550.



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Exercise 12.2

- Q.1. Determine if the following are in proportion.
15,45,40,120

Solution: A proportion is simply a statement that two ratios are equal.
If a,b,c,d are in proportion, It can be written in two ways:
As two equal fractions $ab=cd$; or using a colon, $a:b=c:d$.

Hence, Ratio of 15 to 45= $\frac{15}{45}=\frac{1}{3}$
Ratio of 40 to 120= $\frac{40}{120}=\frac{1}{3}$
Since $15:45=40:120$
Therefore, 15,45,40,120 are in proportion.

- Q.2. Determine if the following are in proportion.
33,121,9,96

Solution: A proportion is simply a statement that two ratios are equal.
If a,b,c,d are in proportion, It can be written in two ways:
As two equal fractions $ab=cd$; or using a colon, $a:b=c:d$.

The ratio of 33 to 121= $\frac{33}{121}=\frac{3}{11}$
The ratio of 9 to 96= $\frac{9}{96}=\frac{3}{32}$
Since $33:121 \neq 9:96$
Therefore, 33,121,9,96 are not in proportion.

- Q.3. Determine if the following are in proportion.
24,28,36,48

Solution: A proportion is simply a statement that two ratios are equal.
If a,b,c,d are in proportion, It can be written in two ways:
As two equal fractions $ab=cd$; or using a colon, $a:b=c:d$.

The ratio of 24 to 28= $\frac{24}{28}=\frac{6}{7}$
The ratio of 36 to 48= $\frac{36}{48}=\frac{3}{4}$
Since $24:28 \neq 36:48$
Therefore, 24,28,36,48 are not in proportion.

- Q.4. Determine if the following are in proportion.
32,48,70,210

Solution: A proportion is simply a statement that two ratios are equal.
If a,b,c,d are in proportion, It can be written in two ways:
As two equal fractions $ab=cd$; or using a colon, $a:b=c:d$.

Ratio of 32 to 48= $\frac{32}{48}=\frac{2}{3}$
Ratio of 70 to 210= $\frac{70}{210}=\frac{1}{3}$
Since $32:48 \neq 70:210$
Therefore, 32,48,70,210 are not in proportion.

- Q.5. Determine if the following are in proportion.
4,6,8,12

Solution: A proportion is simply a statement that two ratios are equal.
If a,b,c,d are in proportion, It can be written in two ways:
As two equal fractions $ab=cd$; or using a colon, $a:b=c:d$. Ratio of 4 to 6= $\frac{4}{6}=\frac{2}{3}$ Ratio of 8 to 12= $\frac{8}{12}=\frac{2}{3}$ Since $4:6=8:12$ Therefore, 4,6,8,12 are in proportion.

Q.6. Determine if the following are in proportion.

33,44,75,100

Solution: We know that if two ratios are equal, we say that they are in proportion.
 Ratio of 33 to 44= $\frac{33}{44}=\frac{3}{4}$
 Ratio of 75 to 100= $\frac{75}{100}=\frac{3}{4}$
 Since $\frac{33}{44}=\frac{75}{100}$
 Therefore, 33,44,75,100 are in proportion.

Q.7. Determine whether the given ratio is in proportion or not.

16:24::20:30

True

Solution: Given: 16:24::20:30

We know that,
 If two ratios are equal, we say that they are in proportion.

To find whether given statement true or false take two ratios separately and simplify. $\frac{16}{24}=\frac{8}{12}$ $\frac{20}{30}=\frac{2}{3}$
 $\frac{8}{12}=\frac{2}{3}$ $\frac{20}{30}=\frac{2}{3}$ Hence, 16:24::20:30 is True.

False

Q.8. Determine whether the given ratio is in proportion or not.

12:18::28:12

TrueFalse

Solution: 12:18::28:12

We know that,
 If two ratios are equal, we say that they are in proportion.

To find whether given statement is true or false take two ratios separately and simplify. $\frac{12}{18}=\frac{2}{3}$ $\frac{28}{12}=\frac{7}{3}$
 $\frac{2}{3} \neq \frac{7}{3}$ Hence, 12:18::28:12 is False.

Q.9. Determine whether the given ratio is in proportion or not.

8:9::24:27

True

Solution: Given: 8:9::24:27

We know that,
 If two ratios are equal, we say that they are in proportion.

To find whether given statement true or false take two ratios separately and simplify. $\frac{8}{9}=\frac{8}{9}$ $\frac{24}{27}=\frac{8}{9}$
 Hence, 8:9::24:27 is True.

False

Q.10. Determine whether the given ratio is in proportion or not.

5.2:3.9::3:4

TrueFalse

Solution: Given: 5.2:3.9::3:4

We know that,
 If two ratios are equal, we say that they are in proportion.

To find whether given statement true or false take two ratios separately and simplify. $\frac{5.2}{3.9}=\frac{1.3}{1}$ $\frac{3}{4}=\frac{3}{4}$
 $\frac{1.3}{1} \neq \frac{3}{4}$ Hence, 5.2:3.9::3:4 is False.

Q.11. Determine whether the given ratio is in proportion or not.

0.9:0.36::10:4

True

Solution: Given: $0.9:0.36::10:4$

We know that,
If two ratios are equal, we say that they are in proportion.

To find whether given statement true or false take two ratios separately and simplify. $\Rightarrow 0.9 \times 0.36 = 0.324 = 104$
 $\Rightarrow 104 = 104 \therefore 0.9:0.36 = 104$ Hence, $0.9:0.36::10:4$ is True.

False

Q.12. Determine whether the given ratio is in proportion or not.

40 persons : 200 persons = ₹15 : ₹75

True

Solution: Given: 40 persons : 200 persons = ₹15 : ₹75

We know that,
If two ratios are equal, we say that they are in proportion.

To find whether given statement true or false take two ratios separately and simplify.

Ratio of 40 persons to 200 persons = $40:200 = 1:5$

Ratio of ₹15 to ₹75 = $15:75 = 1:5$

Since, 40 persons : 200 persons = ₹15 : ₹75

Hence, the statement is true.

False

Q.13. Determine whether the given ratio is in proportion or not.

7.5 litres : 15 litres = 5kg : 10kg

True

Solution: Given: 7.5 litres : 15 litres = 5kg : 10kg

We know that,

If two ratios are equal, we say that they are in proportion. To find whether given statement true or false take two ratios separately and simplify.

Ratio of 7.5 litres to 15 litres = $7.5:15 = 1:2$

Ratio of 5kg to 10kg = $5:10 = 1:2$

Since, 7.5 litres : 15 litres

Hence, the statement is true.

False

Q.14. Determine whether the given ratio is in proportion or not.

99kg : 45kg = ₹44 : ₹20

True

Solution: If two ratios are equal, we say that they are in proportion.

To find whether given statement true or false take two ratios separately and simplify.

The ratio of 99kg to 45kg = $99:45 = 11:5$ The ratio of ₹44 to ₹20 = $44:20 = 11:5$ Since, 99kg : 45kg = ₹44 : ₹20 Hence, the statement is true.

False

Q.15. Determine whether the given ratio is in proportion or not.

32m : 64m = 6sec : 12sec

True

Solution: If two ratios are equal, we say that they are in proportion.

To find whether given statement true or false take two ratios separately and simplify.

Ratio of 32m to 64m = $32:64 = 1:2$ Ratio of 6sec to 12sec = $6:12 = 1:2$ Since, 32m : 64m = 6sec : 12sec Hence, the statement is true.

False

Q.16. 45 km : 60 km = 12 hours : 15 hours

True/False

Solution: If two ratios are equal, we say that they are in proportion.

To find whether given statement true or false take two ratios separately and simplify.

Ratio of 45km to 60km = $\frac{45}{60} = \frac{3}{4}$ Ratio of 12 hours to 15 hours = $\frac{12}{15} = \frac{4}{5}$ Since, 45km:60km \neq 12 hours: 15 hours Hence, the statement is not true.

Q.17. Determine if the following ratios form a proportion. Also, write the middle terms and extreme terms where the ratios form a proportion.

25 cm:1 m and ₹40:₹160

Solution: We know that 1 m = 100 cm
Ratio of 25 cm to 1 m = $\frac{25 \text{ cm}}{1 \times 100 \text{ cm}}$
= $\frac{25}{100} = \frac{1}{4}$
Ratio of ₹40 to ₹160 = $\frac{40}{160} = \frac{1}{4}$
Since the ratios are equal, these are in proportion.

In a statement of proportion four quantities involved.
First and fourth terms are known as extreme terms.
Second and third terms are known as middle terms.
Middle terms = 1, 40
Extreme terms = 25, 160

Hence, the given numbers are in proportion with middle terms as 1 m, ₹40
Extreme terms as 25 cm, ₹160.

Q.18. Determine if the following ratios form a proportion. Also, write the middle terms and extreme terms where the ratios form a proportion.

39 litres: 65 litres and 6 bottles: 10 bottles

Solution: If two ratios are equal, they are in proportion.

Ratio of 39 litres to 65 litres = $\frac{39}{65} = \frac{3}{5}$

Ratio of 6 bottles: 10 bottles = $\frac{6}{10} = \frac{3}{5}$ Since the ratios are equal, these are in proportion. In a statement of proportion four quantities involved. First and fourth terms are known as extreme terms. Second and third terms are known as middle terms. Middle terms = 65, 6 and Extreme terms = 39, 10.

Q.19. Determine if the following ratios form a proportion. Also, write the middle terms and extreme terms where the ratios form a proportion.

2kg:80kg and 25g:625g

Solution: If a:b::c:d are in proportion $ab=cd$

Ratio of 2kg to 80kg = $\frac{2}{80} = \frac{1}{40}$

Ratio of 25g to 625g = $\frac{25}{625} = \frac{1}{25}$ Since the ratios are not equal, therefore these are not in proportion.

Q.20. Determine if the following ratios form a proportion. Also, write the middle terms and extreme terms where the ratios form a proportion.

200ml:2.5 liter and ₹4:₹50

Solution: If two ratios are equal, they are in proportion.

In a statement of proportion four quantities involved. First and fourth terms are known as extreme terms.
Second and third terms are known as middle terms.

We know that 1 litre = 1000 ml.

Ratio of 200ml to 2.5 litres = $\frac{200 \text{ ml}}{(2500) \text{ ml}}$
= $\frac{200}{2500} = \frac{2}{25}$

Ratio of ₹4 to ₹50 = $\frac{4}{50} = \frac{2}{25}$

Since the ratios are equal, therefore these are in proportion.

Middle terms = 2500 ml, ₹4 and Extreme terms = 200 ml, ₹50

Exercise 12.3

Q.1. If the cost of 7m of cloth is ₹1470, find the cost of 5m of cloth. If the required answer is of the form ₹ p, then what is the value of p?
1050

Solution: Given, the cost of 7m of cloth = ₹1470
We need to find the cost of 5m of cloth
∴ Cost of 1m of cloth = $\frac{\text{Cost of 7m of cloth}}{\text{Total length of the cloth}}$
= $\frac{₹1470}{7}$ = ₹210
∴ Cost of 5m of cloth = Cost of 1m of cloth × Required number of meters
= ₹210 × 5 = ₹1050
Hence, the cost of 5m of cloth is ₹1050.
Here, the value of p = 1050

Q.2. Raju purchases 10 pens for ₹150 and Manish buys 7 pens for ₹84. Can you say who got the pens cheaper?
Manish

Solution: Given,
Raju purchase 10 pens for ₹150
Cost of each pen = $\frac{\text{Total cost}}{\text{Total number of pens}}$
∴ Cost of 1 pen purchased by Raju = $\frac{₹150}{10}$ = ₹15
Manish purchases 7 pens for ₹84
∴ Cost of 1 pen purchased by Manish = $\frac{₹84}{7}$ = ₹12
Cost of 1 pen purchased by Raju > Cost of 1 pen purchased by Manish.
Hence, Manish got the pens cheaper.

Q.3. Anish made 42 runs in 6 overs and Anup made 63 runs in 7 overs. Who made more runs per over?
Anup

Solution: Given,
Runs made by Anish in 6 overs = 42 runs
Runs made per over = $\frac{\text{Total runs made}}{\text{Total number of overs}}$
∴ Runs made by Anish in 1 over = $\frac{42}{6}$ = 7 runs
Runs made by Anup in 7 Overs = 63 runs
∴ Runs made by Anup in 1 over = $\frac{63}{7}$ = 9 runs
Hence, Anup made more runs per over than Anish.

Q.4. Ekta earns ₹3000 in 10 days. How much will she earn in 30 days.
9000

Solution: Given, Ekta earnings of 10 days = ₹3000
∴ Earning of 1 day = $\frac{\text{Earning of } x \text{ number of days}}{x \text{ number of days}}$
= $\frac{₹3000}{10}$ = ₹300 ∴ Earning of 30 days = Earning of one day × 30 = ₹300 × 30 = ₹9,000
Therefore, she earns ₹9000 in 30 days.

Q.5. If it has rained 276 mm in the last 3 days, How many cm of rain will fall in one full week (7 days).
Assume that the rain continues to fall at the same rate.
64.4

Solution: Given,
Rain in 3 days = 276mm
∴ Rain in 1 day = $\frac{\text{Rain in } x \text{ number of days}}{x \text{ number of days}}$ = $\frac{276}{3}$ = 92mm
∴ Rain in 7 days = Rain in 1 day × x number of days
= 92 × 7 = 644mm
We know that 1mm = 0.1cm
644mm = 644 × 0.1cm = 64.4cm
Hence, 64.4 cm of rain will fall in one full week.

Q.6. Cost of 5 kg of wheat is ₹91.50 and the cost of 8kg of wheat is ₹K. Find the value of K.
146.40

Solution: Given, cost of 5kg of wheat = ₹91.50

∴ Cost of 1kg of wheat = ₹91.50/5 = ₹18.30

We know that, Cost of n kg of wheat = Cost of 1 kg of wheat × n. ∴ Cost of 8kg of wheat = ₹18.30 × 8 = ₹146.40
Hence, the cost of 8kg of wheat is ₹146.40. Thus, the value of K is 146.40

Q.7. Cost of 5 kg of wheat is ₹91.50.

What quantity of wheat can be purchased in ₹183 If the required answer is of the form p kg, then what is the value of p?
10

Solution: From ₹91.50, quantity of wheat can be purchased = 5kg
∴ From ₹1, quantity of wheat can be purchased = 5/91.50kg
Quantity of wheat that can be purchased for ₹n = quantity of wheat that can be purchased for one rupee × n.
∴ For ₹183, quantity of wheat can be purchased = 5/91.50 × 183 = 10kg
Therefore, 10kg of wheat can be purchased in ₹183.

Here, the value of p = 10

Q.8. The temperature dropped 15 degree Celsius in the last 30 days. If the rate of temperature drop remains the same, how many degrees will the temperature drop in the next ten days.

If the k° temperature drop in next ten days, then find the value of k?
5

Solution: Given,
Degree of temperature dropped in 30 days = 15 degree Celsius.
∴ Degree of temperature dropped in 1 day = 15/30 = 0.5 degree Celsius.
∴ Degree of temperature dropped in next 10 days = 0.5 × 10 = 5 degree Celsius.
Therefore, 5 degree Celsius temperature will drop in next ten days.

Here, k = 5

Q.9. Shaina pays ₹ 15000 as rent for 3 months. How much does she has to pay for a whole year, if the rent per month remains same.

If the per month rent is ₹k, then find the value of k. (Write the answer in the box without commas)
60000

Solution: Given rent paid for 3 months = ₹15000
∴ Rent paid for 1 month = 15000/3 = ₹5000
∴ Rent to be paid for 12 months = 5000 × 12 = ₹60,000 Therefore, the total rent she has pay for a whole year is ₹60,000. Here, the value of k = 60000

Q.10. Cost of 4 dozen bananas is ₹180. How many bananas can be purchased for ₹90?
24

Solution: Given, the cost of 4 dozen bananas = ₹180
We know that, 1 dozen bananas = 12 bananas.
Hence, cost of 48 bananas = ₹180
∴ From ₹180, number of bananas can be purchased = 48
∴ From ₹1, number of bananas can be purchased = 48/180 = 4/15
∴ From ₹90, number of bananas can be purchased = 4/15 × 90 = 24
Therefore, 24 bananas can be purchased for ₹90.

Q.11. The weight of 72 books is 9 kg. What is the weight of 40 such books?

If the required answer is of the form p kg, then what is the value of p?
5

Solution: Given weight of 72 books = 9kg

We know that,

Weight of n books = Weight of 1 book × n. ∴ The weight of 1 book = 9/72 = 1/8 ∴ The weight of 40 books = 1/8 × 40 = 5kg Hence, the weight of 40 books is 5kg. Therefore, the value of p is 5.

Q.12. A truck requires 108 liters of diesel for covering a distance of 594km. How much diesel will be required by the truck to cover a distance of 1650km?

300

Solution:

Given,

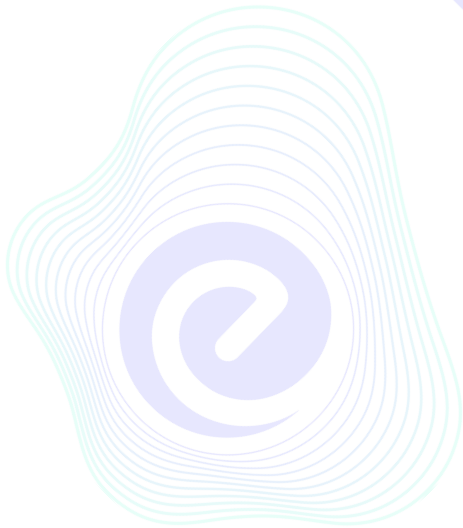
For covering 594km, required diesel for a truck =108 litres

Diesel required for distance covering of n km = Diesel required for covering a distance of 1 km \times n.

\therefore For covering 1km, required diesel for a truck = $108 \div 594 = 211$ litres

\therefore For covering 1650km, required diesel for a truck = $211 \times 1650 = 300$ litres

Hence, 300 litres of diesel will be required by the truck to cover a distance of 1650km.



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