NCERT SOLUTIONS FOR CLASS 6 MATHS RATIOS AND PROPORTIONS EXERCISE 12.1

Exercise 12.1

Question 1:

There are 20 girls and 15 boys in a class.

(a) What is the ratio of number of girls to the number of boys?

(b)What is the ratio of number of girls to the total number of students in the class?

Answer:

Number of girls = 20

Number of boys = 15

Total number of students = 20 + 15 = 35

(a) Ratio of number of girls to boys = $\frac{20}{15}=\frac{4}{3}$

(b) Ratio of number of girls to total students = $\frac{20}{35}=\frac{4}{7}$

Question 2:

Out of 30 students in a class, 6 like football, 12 like cricket and remaining like tennis. Find the ratio of

(a) Number of students liking football to number of students liking tennis.

(b) Number of students liking cricket to total number of students.

Answer:

Number of students who like football = 6

Number of students who like cricket = 12

Number of students who like tennis = 30 − 6 − 12 = 12

(a) Number of students liking football to number of students liking tennis.

(b) Number of students liking cricket to total number of students.

Answer:

Number of students who like football = 6

Number of students who like cricket = 12

Number of students who like tennis = 30 − 6 − 12 = 12

(a) Ratio of the number of students liking football to the number of students liking tennis

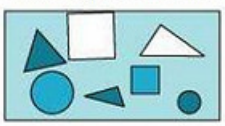
$=\frac{6}{12}=\frac{1}{2}$

(b) Ratio of the number of students liking cricket to the total number of

students = $\frac{12}{30}=\frac{2}{5}$

Question 3:

See the figure and find the ratio of



(a) Number of triangles to the number of circles inside the rectangle.

(b) Number of squares to all the figures inside the rectangle.

(c) Number of circles to all the figures inside the rectangle.

(c) Number of circles to all the figures inside the rectangle.

Answer:

Number of triangles = 3

Number of circles = 2

Number of squares = 2

Total number of figures = 7

(a) Ratio of the number of triangles to the number of circles = $\frac{3}{2}$

(b) Ratio of the number of squares to all the figures in the rectangle = $\frac{2}{7}$

(c) Ratio of the number of circles to all the figures in the rectangle = $\frac{2}{7}$

Question 4:

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.

Answer:

The distance travelled in an hour by a certain object is called the speed of that object.

Distance travelled by Hamid in one hour = 9 km

Distance travelled by Akhtar in one hour = 12 km

Hamid's speed = 9 km/hr

Akhtar's speed = 12 km/hr

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

Question 5:

Fill in the following blanks:

$\frac{15}{18} = \frac{\square}{6} = \frac{10}{\square} = \frac{\square}{30}$ [Are these equivalent ratios?]

Answer:

$\frac{15}{18} = \frac{5\times3}{6\times3} = \frac{5}{6}$

$\frac{5}{6} = \frac{5}{6}\times\frac{2}{2} = \frac{10}{12}$

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

Therefore, 5, 12, 25 will come in the blanks respectively.

Yes, all these are equivalent ratios.

Question 6:

Find the ratio of the following:

(a) 81 to 108 (b) 98 to 63

(c) 33 km to 121 km (d) 30 minutes to 45 minutes

Answer:

(a) $\frac{81}{108} = \frac{3\times3\times3\times3}{2\times2\times3\times3\times3} = \frac{3}{4}$

(b) $\frac{98}{63} = \frac{14\times7}{9\times7} = \frac{14}{9}$

(c) $\frac{33}{121}=\frac{3\times11}{11\times11}=\frac{3}{11}$

(d) $\frac{30}{45}=\frac{2\times3\times5}{3\times3\times5}=\frac{2}{3}$

Question 7:

Find the ratio of the following:

(a) 30 minutes to 1.5 hours (b) 40 cm to 1.5 m

(c) 55 paise to Re1 (d) 500 mL to 2 litres

Answer:

(a) 30 min $=\frac{30}{60}=0.5$ hours

Required ratio $=\frac{0.5}{1.5}=\frac{0.5\times1}{0.5\times3}=\frac{1}{3}$

(b) 40 cm to 1.5 m

1.5 m = 150 cm

Required ratio $=\frac{40}{150}=\frac{4}{15}$

(c) 55 paise to Re 1

Re 1 = 100 paise

Required ratio $=\frac{55}{100}=\frac{11\times5}{20\times5}=\frac{11}{20}$

(d) 500 mL to 2*l*

1*l* = 1000 mL

2*l* = 2000 mL

Required ratio $=\frac{500}{2000}=\frac{5}{20}=\frac{5}{5\times4}=\frac{1}{4}$

Question 8:

In a year, Seema earns Rs 1, 50, 000 and saves Rs 50, 000. Find the ratio of

(a) Money that Seema earns to the money she saves.

(b) Money that she saves to the money she spends.

Answer:

Money earned = Rs 150000

Money saved = Rs 50000

Money spent = Rs 150000 − Rs 50000 = Rs 100000

(a) Ratio of money earned to money saved $=\frac{150000}{50000}=\frac{3}{1}$

(b) Ratio of money saved to money spent $=\frac{50000}{100000}=\frac{1}{2}$

Question 9:

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

Answer:

Ratio required $=\frac{102}{3300}=\frac{2\times3\times17}{2\times3\times550}=\frac{17}{550}$

Question 10:

In a college, out of 4320 students, 2300 are girls. Find the ratio of

(a) Number of girls to the total number of students.

(b) Number of boys to the number of girls.

(c) Number of boys to the total number of students.

Answer:

Total number of students = 4320

Number of girls = 2300

Number of boys = 4320 − 2300 = 2020

(a) Required ratio $=\frac{2300}{4320}=\frac{2\times2\times5\times115}{2\times2\times5\times216}=\frac{115}{216}$

(b) Required ratio $=\frac{2020}{2300}=\frac{2\times2\times5\times101}{2\times2\times5\times115}=\frac{101}{115}$

(c) Required ratio $=\frac{2020}{4320}=\frac{2\times2\times5\times101}{2\times2\times5\times216}=\frac{101}{216}$

Question 11:

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

(a) Number of students who opted basketball to the number of students who opted table tennis.

(b) Number of students who opted cricket to the number of students opting basketball.

(c) Number of students who opted basketball to the total number of students.

Answer:

(a) Required ratio = $\frac{750}{250}=\frac{3}{1}$

(b) Required ratio = $\frac{800}{750}=\frac{16}{15}$

(c) Required ratio = $\frac{750}{1800}=\frac{25}{60}=\frac{5}{12}$

Question 12:

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

Answer:

Cost of a dozen pens = Rs 180

Cost of 1 pen = $\frac{180}{12}=\text{Rs } 15$

Cost of a ball pen = $\frac{56}{8}=\text{Rs } 7$

Required ratio = $\frac{15}{7}$

Question 13:

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 the hall (in metres)	10	?	40
Length of the hall (in metres)	25	50	?

Answer:

(i) Length = 50 m

$\frac{\text{Breadth}}{50}=\frac{2}{5}$

5 × Breadth = 50 × 2 (By cross-multiplication)

Breadth = 20 m

(ii) Breadth = 40 m

$\frac{40}{\text{Length}}=\frac{2}{5}$

2 × Length = 5 × 40 (By cross-multiplication)

Length = 100 m

Question 14:

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

Answer:

Terms of 3 : 2 are 3 and 2.

Sum of these terms = 3 + 2 = 5

Sheela will get $\frac{3}{5}$ of total pens and Sangeeta will get $\frac{2}{5}$ of total pens.

Number of pens with Sheela = $\frac{3}{5}\times 20=12$

Number of pens with Sangeeta = $\frac{2}{5}\times 20=8$

Question 15:

Mother wants to divide Rs 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.

Answer:

Ratio of ages = $\frac{15}{12}=\frac{5}{4}$

Therefore, mother wants to divide Rs 36 in a ratio of 5 : 4.

Terms of 5 : 4 are 5 and 4.

Sum of these terms = 5 + 4 = 9

Shreya will get $\frac{5}{9}$ of the total money and Bhoomika will get $\frac{4}{9}$ of it.

Amount that Shreya will get = $\frac{5}{9}\times 36 = 20$

Amount that Bhoomika will get = $\frac{4}{9}\times 36 = 16$

Therefore, Shreya and Bhoomika will get Rs 20 and Rs 16 respectively.

Question 16:

Present age of father is 42 years and that of his son is 14 years. Find the ratio of

(a) Present age of father to the present age of son.

(b) Age of the father to the age of son, when son was 12 years old.

(c) Age of father after 10 years to the age of son after 10 years.

(d) Age of father to the age of son when father was 30 years old.

Answer:

(a) Present age of father = 42 years

Present age of son = 14 years

Required ratio = $\frac{42}{14} = \frac{3}{1}$

(b) Two years ago, the age of the son was 12 years and the age of the father was 42 − 2 = 40 years

Required ratio = $\frac{40}{12} = \frac{4\times 10}{4\times 3} = \frac{10}{3}$

(c) After 10 years, the age of the father and son will be 52 years and 24 years respectively.

Required ratio = $\frac{52}{24} = \frac{4\times 13}{4\times 6} = \frac{13}{6}$

(d) 12 years ago, the father was 30 years old.

At that time, age of son = 14 − 12 = 2 years

Required ratio = $\frac{30}{2} = \frac{2\times 15}{2} = \frac{15}{1}$

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