NCERT QUESTIONS WITH SOLUTIONS

FIGURE IT OUT-01

1. Circle the following statements of proportion that are true.

(i) 4 : 7 :: 12 : 21 (ii) 8 : 3 :: 24 : 6

(iii) 7 : 12 :: 12 : 7 (iv) 21 : 6 :: 35 : 10

(v) 12 : 18 :: 28 : 12 (vi) 24 : 8 :: 9 : 3

Sol. (i) Given statement is 4 : 7 :: 12 : 21.

This is true if $\frac{4}{7}=\frac{12}{21}$

Here $\frac{12}{21} = \frac{12\div3}{21\div3}=\frac{4}{7} = \frac{4}{7}$

(ii) Given statement is 8 : 3 :: 24 : 6.

This is true if, $\frac{8}{3}=\frac{24}{6}$

Here $\frac{24}{6}=\frac{24\div3}{6\div3}=\frac{8}{2}=4\neq\frac{8}{3}$

(iii) Given statement is 7 : 12 :: 12 : 7.

This is true if, $\frac{7}{12}=\frac{12}{7}$

Here $\frac{7}{12}\neq\frac{12}{7}$

(iv) Given statement is 21 : 6 :: 35 : 10.

This is true if, $\frac{21}{6}=\frac{35}{10}$

Here $\frac{21}{6}=\frac{21\div3}{6\div3}=\frac{7}{2};\frac{35}{10}=\frac{35\div5}{10\div5}=\frac{7}{2}$

(v) Given statement is 12 : 18 :: 28 : 12.

This is true if, $\frac{12}{18}=\frac{28}{12}$

Here $\frac{12}{18}=\frac{12\div6}{18\div6}=\frac{2}{3};\frac{28}{12}=\frac{28\div4}{12\div4}=\frac{7}{3}$ and $\frac{2}{3}\neq\frac{7}{3}$

(vi) Given statement is 24 : 8 :: 9 : 3.

This is true if, $\frac{24}{8}=\frac{9}{3}$

Here $\frac{24}{8}=3;\ \frac{9}{3}=3$ and 3 = 3

2. Give 3 ratios that are proportional to 4 : 9.

_____ : _____ _____ : _____ _____ : _____

Sol. The given ratio is 4 : 9.

We have $\frac{4}{9}=\frac{4\times2}{9\times2}=\frac{4\times3}{9\times3}=\frac{4\times4}{9\times4}$

or $\frac{4}{9}=\frac{8}{18}=\frac{12}{27}=\frac{16}{36}$

$\therefore$ 4 : 9 :: 8 : 18; 4 : 9 :: 12 : 27, and 4 : 9 :: 16 : 36

$\therefore$ Ratios 8 : 18, 12 : 27 and 16 : 36 are proportional to the given ratio 4 : 9.

3. Fill in the missing numbers for these ratios that are proportional to 18 : 24.

(i) 3 : _____

(ii) 12 : _____

(iii) 20 : _____

(iv) 27 : _____

Sol. (i) Given ratio is 18 : 24.

Let 18 : 24 :: 3 : x

$\therefore$ $\frac{18}{24}=\frac{3}{x}$ or $\frac{3}{4}=\frac{3}{x}$ or x = 4

$\therefore$ Missing number in the ratio 3 : _____ is 4.

(ii) Let 18 : 24 :: 12 : x.

$\frac{18}{24}=\frac{12}{x}$ or $\frac{3}{4}=\frac{12}{x}$

or 3x = 48 or x = $\frac{48}{3}=16$

$\therefore$ Missing number in the ratio 12 : _____ is 16.

(iii) Let 18 : 24 :: 20 : x.

$\therefore$ $\frac{18}{24}=\frac{20}{x}$ or $\frac{3}{4}=\frac{20}{x}$

or 3x = 80 or x = $\frac{80}{3}$

$\therefore$ Missing number in the ratio 20 : _____ is $\frac{80}{3}$.

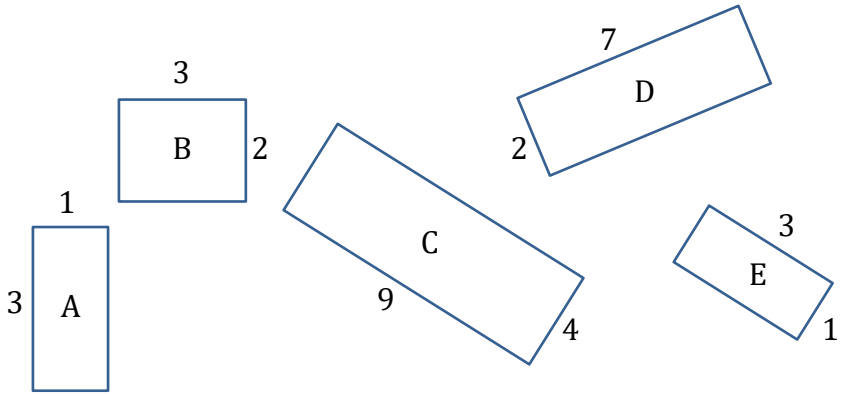
(iv) Let 18 : 24 :: 27 : x.

$\therefore$ $\frac{18}{24}=\frac{27}{x}$ or $\frac{3}{4}=\frac{27}{x}$

or 3x = 108 or x = $\frac{108}{3}=36$

$\therefore$ Missing number in the ratio 27 : _____ is 36.

4. Look at the following rectangles. Which rectangles are similar to each other? You can verify this by measuring the width and height using a scale and comparing their ratios.

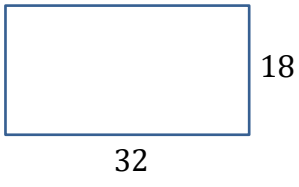


Sol. Using a scale, we measure the width and height of given rectangles.
Here, the ratio 'Width : Height' for given rectangles A, B, C, D, and E are respectively 1 : 3, 3 : 2, 9 : 4, 7 : 2 and 3 : 1.
These ratios are all distinct. The ratios of A and E are 1 : 3 and 3 : 1 respectively.

Rectangle	**Width (in mm)**	**Height (in mm)**	**Ratio =** $\frac{\text{Width}}{\text{Height}}$
A	5	15	$\frac{5}{15}=\frac{1}{3}$
B	15	10	$\frac{15}{10}=\frac{3}{2}$
C	45	20	$\frac{45}{20}=\frac{9}{4}$
D	35	10	$\frac{35}{10}=\frac{7}{2}$
E	15	5	$\frac{15}{5}=\frac{3}{1}$

$\therefore$ For A and E, one side is 3 times the other side.
$\therefore$ Only rectangles A and E are similar.

5. Look at the following rectangle. Can you draw a smaller rectangle and a bigger rectangle with the same width-to-height ratio in your notebook? Compare your rectangles with your classmates' drawings. Are all of them the same? If they are different from yours, can you think why? Are they wrong?



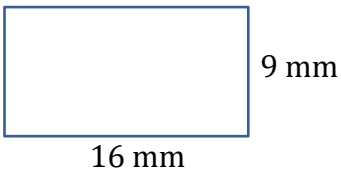
Sol: For the given rectangle,
Width = 32 mm and height = 18 mm
∴ Ratio is 32 : 18.
We shall draw smaller and bigger rectangles and similar to the given rectangle by considering different 'factors of change'.

(i) Let the factor of change be $\frac{1}{2}$

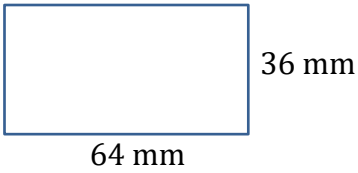
∴ New width = $\frac{1}{2} \times 32 = 16$ mm

and new height = $\frac{1}{2} \times 18 = 9$mm

A new, similar rectangle is shown in the figure.



(ii) Let 'factor of change' be 2.
∴ New width = 2 × 32 = 64 mm and new height = 2 × 18 = 36 mm

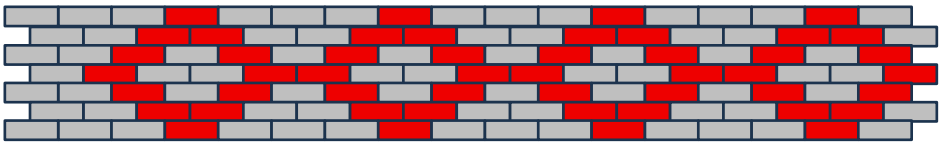


A new, similar rectangle is shown in the figure. The rectangles drawn by other classmates are all different, but they are all similar to the given rectangle.

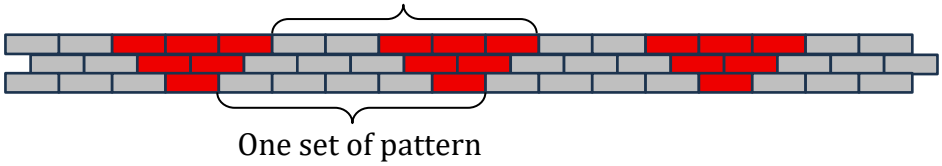
6. The following figure shows a small portion of a long brick wall with patterns made using coloured bricks. Each wall continues this pattern throughout the wall. What is the ratio of grey bricks to coloured bricks? Try to give the ratios in their simplest form.

(a)

(b)

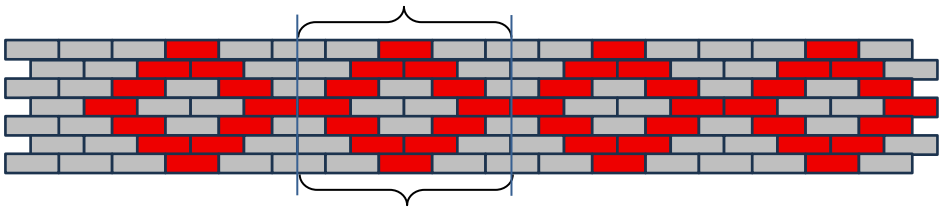


Sol. (a) We consider one set of patterns in the given wall.



Number of grey bricks in one set of pattern = 2 + 3 + 4 = 9
Number of coloured bricks in one set of pattern = 3 + 2 + 1 = 6
∴ Ratio of grey bricks to coloured bricks = 9 : 6
We have 9 : 6 = 3 : 2
∴ Ratio in the simplest form = 3 : 2

(b) We use one set of patterns on the given wall



One set of pattern

Number of grey bricks in one set of pattern

$$= \left(\frac{1}{2}+1+1+\frac{1}{2}\right)+\left(\frac{1}{2}+1+1+\frac{1}{2}\right)+\left(\frac{1}{2}+1+1+\frac{1}{2}\right)+\left(\frac{1}{2}+1+1+\frac{1}{2}\right)+[1+1+1+1]$$

$= (3 + 3 + 3 + 3 + 4) = 16$

Number of coloured bricks in one set of pattern

$= 1 + (1 + 1) + (1 + 1) + (1 + 1) + (1 + 1) + 1$

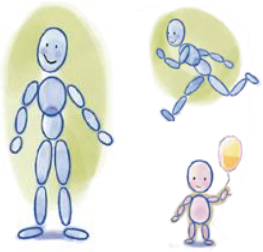
$= 1 + 2 + 2 + 2 + 2 + 2 + 1 = 12$

$\therefore$ Ratio of grey bricks to coloured bricks = 16 : 12

We have 16 : 12 = 4 : 3

$\therefore$ Ratio in the simplest form = 4 : 3

7. Let us draw some human figures. Measure your friend's body-the lengths of their head, torso, arms, and legs. Write the ratios as mentioned below.



head : torso _____ : _____

torso : arms _____ : _____

torso : legs _____ : _____

1. Head : Torso

The ratio of the length of the head to the length of the torso. For instance, if the length of the head is 10 cm and the length of the torso is 30 cm, the ratio would be:

$$\text{Head : Torso} = \frac{\text{Head}}{\text{Torso}} = \frac{10}{30} = \frac{1}{3}$$

2. Torso : Arms

The ratio of the length of the torso to the length of the arms. For example, if the length of the torso is 30 cm and the length of the arms is 20 cm, the ratio would be:

$$\text{Torso : Arms} = \frac{\text{Torso}}{\text{Arms}} = \frac{30}{20} = \frac{3}{2}$$

3. Torso : Legs

The ratio of the length of the torso to the length of the legs. For example, if the length of the torso is 30 cm and the length of the legs is 50 cm, the ratio would be:

$$\text{Torso : Legs} = \frac{\text{Torso}}{\text{Legs}} = \frac{30}{50} = \frac{3}{5}$$

FIGURE IT OUT-02

1. The Earth travels approximately 940 million kilometres around the Sun in a year. How many kilometres will it travel in a week?

Sol. We know that:

1 million = 10 lakh = 10,00,000

and 1 year = $\frac{365}{7}$ weeks

940 million kilometres, i.e., 940 × 10,00,000 kilometres, are travelled by the Earth in 1 year, i.e., in $\frac{365}{7}$ weeks.

Let the Earth travel x kilometres 1 week

$\therefore$ The ratios 940 × 10,00,000 : $\frac{365}{7}$ and x : 1 are in proportion.

$$\Rightarrow \frac{940\times1000000}{\frac{365}{7}} = \frac{x}{1}$$

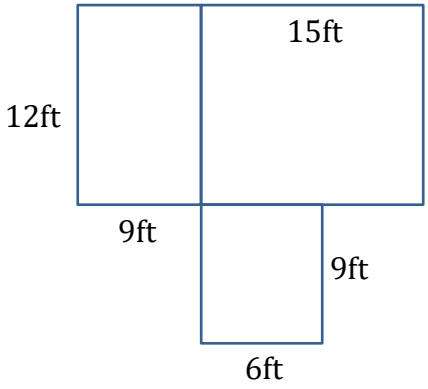
$$\Rightarrow x = \frac{940\times1000000\times7}{365}$$

$$\Rightarrow x = \frac{188\times7000000}{73}$$

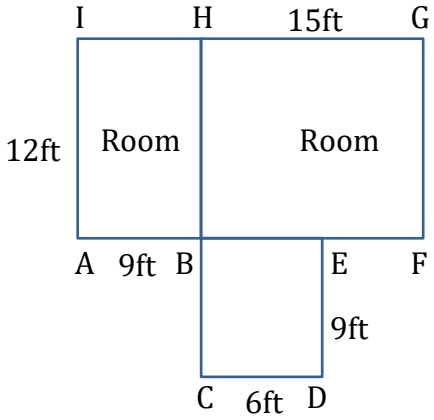
$\Rightarrow$ x = 18027397 (nearly)

$\therefore$ In week, Earth travels nearly 1,80,27,397 kilometres around the Sun.

2. A mason is building a house in the shape shown in the diagram. He needs to construct both the outer walls and the inner wall that separates the two rooms. To build a wall of 10 feet, he requires approximately 1450 bricks. How many bricks would he need to build the house? Assume all walls are of the same height and thickness.



Sol.



Number of bricks required for a 10 ft wall = 1450

$\therefore$ Ratio of length of wall to number of bricks = 10 : 1450

Total length of walls = AI + CH + DE + FG + IG + AF + CD

= 12 + (9 + 12) + 9 + 12 + (9 + 15) + (9 + 15) + 6 = 108 ft

Let x bricks be required for a 108 ft long wall.

$\therefore$ Ratio of length of wall to number of bricks = 108 : x

These ratios are in proportion.

$\therefore$ 10 : 1450 :: 108 : x

$\Rightarrow \frac{10}{1450} = \frac{108}{x}$

$\Rightarrow \frac{1}{145} = \frac{108}{x}$

$\Rightarrow$ x = 145 × 108 = 15,660

$\therefore$ Number of required bricks = 15,660

FIGURE IT OUT-03

1. Divide ₹ 4,500 into two parts in the ratio 2 : 3.

Sol. Given ratio = 2 : 3

Amount to be divided = ₹ 4,500

$\therefore$ First part = $\frac{2}{2+3}$ × 4,500

= $\frac{2}{5} \times 4500$

= 2 × 900

= ₹ 1,800

$\therefore$ Second part = $\frac{3}{2+3}$ × 4,500

= $\frac{3}{5}$ × 4,500

= 3 × 900

= ₹ 2,700

$\therefore$ Two parts are ₹1,800 and ₹2,700.

Verification: 1,800 : 2,700 = $\frac{1800}{2700} = \frac{18}{27} = \frac{2}{3}$ = 2 : 3 and 1,800 + 2,700 = 4,500.

2. In a science lab, acid and water are mixed in the ratio 1 : 5 to make a solution. In a bottle that has 240 mL of the solution, how much acid and water does the solution contain?

Sol. Ratio of acid and water = 1 : 5

Quantity of solution = 240 mL

$\therefore$ Quantity of acid = $\frac{1}{1+5} \times 240$

$= \frac{1}{6} \times 240 = 40$ mL

$\therefore$ Quantity of water = $\frac{1}{1+5} \times 240$

$= \frac{5}{6} \times 240 = 200$ mL

$\therefore$ Quantities of acid and water in the solution are 40 mL and 200 mL

Verification: 40 : 200 = $\frac{40}{200} = \frac{1}{5}$ = 1 : 5 and 40 + 200 = 240.

3. Blue and yellow paints are mixed in the ratio 3 : 5 to produce green paint. To produce 40 mL of green paint, how much of these two colours are needed? To make the paint a lighter shade of green, I added 20 mL of yellow to the mixture. What is the new ratio of blue and yellow in the paint?

Sol. Ratio of blue and yellow paints = 3 : 5

Quantity of green paint = 40 mL

$\therefore$ Quantity of blue paint = $\frac{3}{3+5} \times 40 = \frac{3}{8} \times 40 = 15$ mL

$\therefore$ Quantity of yellow paint = $\frac{5}{3+5} \times 40 = \frac{5}{8} \times 40 = 25$ ML

Addition of yellow paint to the mixture = 20 mL

$\therefore$ New quantity of blue paint = 15 mL

$\therefore$ New quantity of yellow paint = 25 mL + 20 mL = 45 mL

$\therefore$ New ratio of blue and yellow paints = 15 : 45 = 1 : 3.

4. To make soft idlis, you need to mix rice and urad dal in the ratio 2 : 1. If you need 6 cups of this mixture to make idlis tomorrow morning, how many cups of rice and urad dal will you need?

Sol. Ratio of rice and urad dal = 2 : 1

Total number of cups of mixture = 6

$\therefore$ Number of cups of rice = $\frac{2}{2+1} \times 6 = \frac{2}{3} \times 6 = 4$

$\therefore$ Number of cups of urad dal = $\frac{1}{2+1} \times 6 = \frac{1}{3} \times 6 = 2$

$\therefore$ 4 cups of rice and 2 cups of urad dal are to be mixed.

5. I have one bucket of orange paint that I made by mixing red and yellow paints in the ratio of 3 : 5. I added another bucket of yellow paint to this mixture. What is the ratio of red paint to yellow paint in the new mixture?

Sol. Let the capacity of one bucket be x L.

Ratio of red paint and yellow paint = 3 : 5

∴ Quantity of red paint in the bucket} = $\frac{3}{3+5} \times x = \frac{3x}{8}$

∴ Quantity of yellow paint in the bucket = $\frac{3}{3+5} \times x = \frac{5x}{8}$

One bucket of yellow paint is added to the mixture.

∴ New quantity of red paint in the mixture = $\frac{3x}{8}$

∴ New quantity of yellow paint in the mixture} = $\frac{5x}{8} + x = \frac{13x}{8}$

∴ New ratio of red paint and yellow paint in the mixture = $\frac{3x}{8} : \frac{13x}{8}$ = 3 : 13.

FIGURE IT OUT-04

1. Anagh mixes 600 mL of orange juice with 900 mL of apple juice to make a fruit drink. Write the ratio of orange juice to apple juice in its simplest form.

Sol. Quantity of orange juice = 600 mL

Quantity of apple juice = 900 mL

∴ Ratio of orange juice to apple juice = 600 : 900

∴ Ratio in the simplest form = 600 : 900 = 2 : 3

2. Last year, we hired 3 buses for the school trip. We had a total of 162 students and teachers who went on that trip, and all the buses were full. This year we have 204 students. How many buses will we need? Will all the buses be full?

Sol. Number of buses for 162 students and teachers = 3

Since the buses were full, the capacity of 1 bus = $\frac{162}{3}$ = 54

∴ Ratio of number of seats to the number of buses is 54 : 1.

We have

54 : 1 = 2(54) : 2(1) = 108 : 2

54 : 1 = 3(54) : 3(1) = 162 : 3

54 : 1 = 4(54) : 4(1) = 216 : 4

∴ Capacity of 4 buses = 216

∴ For 204 students, we shall need 4 buses.

Since 216 – 204 = 12, we have 12 vacant seats in the buses.

3. The area of Delhi is 1,484 sq. km, and the area of Mumbai is 550 sq. km. The population of Delhi is approximately 30 million, and that of Mumbai is 20 million people. Which city is more crowded? Why do you say so?

Sol. Area of Delhi = 1,484 sq. km

Population of Delhi = 30 million

Area of Mumbai = 550 sq. km

Population of Mumbai = 20 million

$\therefore$ Ratio of area to population for Delhi = 1484 : 30

$\therefore$ Ratio of area to population for Mumbai = 550 : 20

Factor of change of area = $\frac{550}{1484}$ = 0.371 (nearly)

Factor of change of population = $\frac{20}{30}$ = 0.667 (nearly)

Since 0.667 > 0.371, Mumbai is more crowded than Delhi.

Alternative Method:

Ratio of area to population for Delhi = 1484 : 30

Let the density of Delhi and Mumbai be the same, and there be x people in Mumbai.

$\therefore$ The ratios 1,484 : 30 and 550 : x are in proportion.

$\therefore$ $\frac{1484}{30} = \frac{550}{x}$

$\Rightarrow$ 1484x = 30 × 550 = 16,500

$\Rightarrow$ x = $\frac{16500}{1484}$ = 11.118

There should be 11.118 million people in Mumbai. But the population of Mumbai is 20 million.

$\therefore$ Mumbai is more crowded than Delhi.

4. A crane of height 155 cm has its neck and the rest of its body in the ratio 4 : 6. For your height, if your neck and the rest of the body also had this ratio, how tall would your neck be?

Sol. The ratio of the height of the neck and the height of the rest of the body of a crane is 4 : 6.

My height is 65 inches, i.e., 165 cm.

Let the ratio of the height of my neck and the height of the rest of my body also be 4 : 6.

$\therefore$ Height of my neck = $\left(\frac{4}{4+6} \times 165\right)$ cm = 66 cm

5. Let us try an ancient problem from Lilavati. At that time, weights were measured in a unit named palas, and niskas was a unit of money. "If $2\frac{1}{2}$ palas of saffron costs $\frac{3}{7}$ niskas O expert businessman! Tell me quickly, what quantity of saffron can be bought for 9 niskas?"

Sol. Here, the unit of weight in palas and the unit of money are niskas.

Cost of $2\frac{1}{2}$ palas of saffron} = $\frac{3}{7}$ niskas

Ratio of weight to price is $2\frac{1}{2}:\frac{3}{7}$

or $\frac{5}{2}:\frac{3}{7}$

or 35 : 6

Let x palas of saffron be bought for 9 niskas.

$\therefore$ Ratio of weight to price is x : 9

These ratios are in proportion.

$\therefore$ 35 : 6 : : x : 9

$\Rightarrow \frac{35}{6}=\frac{x}{9}$

$\Rightarrow$ 6x = 35 × 9

$\Rightarrow$ x = 52.5

$\therefore$ 52.5 palas of saffron can be bought for 9 niskas.

6. Harmain is a 1-year-old girl. Her elder brother is 5 years old. What will be Harmain's age when the ratio of her age to her brother's age is 1 : 2?

Sol. The ages of Harmain and her brother are 1 year and 5 years.

Let x years be the time until the ratio of their ages is 1 : 2.

Age of Harmain after x years = (1 + x) years.

Age of her brother after x years = (5 + x) years.

$\therefore$ After x years, ratio of their ages = 1 + x : 5 + x

The ratios are in proportion.

$\therefore$ 1 : 2 : : 1 + x : 5 + x

$\Rightarrow \frac{1}{2}=\frac{1+x}{5+x}$

$\Rightarrow$ 5 + x = 2(1 + x)

$\Rightarrow$ 5 + x = 2 + 2x

$\Rightarrow$ 2x – x = 5 – 2

$\Rightarrow$ x = 3

$\therefore$ After 3 years, the age of Harmain = 1 + 3 = 4 years.

Verification:

After 3 years, age of her brother = 5 + 3 = 8 years

Also, the ratio of their ages = 4 : 8 = 1 : 2.

7. The mass of equal volumes of gold and water is in the ratio 37 : 2. If 1 litre of water is 1 kg in mass, what is the mass of 1 litre of gold?

Sol. The ratio of masses of gold and water, when their volumes are the same, is 37 : 2.

Mass of 1 litre of water = 1 kg

Let the mass of 1 litre of gold = x kg.

$\therefore$ With equal volumes, the ratio of masses of gold and water is x : 1.

These ratios are in proportion.

37 : 2 :: x : 1

$\Rightarrow \quad \frac{37}{2} = \frac{x}{1}$

$\Rightarrow \quad x = \frac{37}{2}$

Thus, the mass of 1 litre of gold is $\frac{37}{2}$ kg.

8. It is good farming practice to apply 10 tonnes of cow manure for 1 acre of land. A farmer is planning to grow tomatoes in a plot of size 200 ft by 500 ft. How much manure should he buy? (Please refer to the section on Unit Conversions earlier in this chapter).

Sol. We have 1 ton = 1,000 kg.

$\therefore$ 10 tonnes = 10 × 1,000 = 10,000 kg

Also, 1 acre = 43,560 sq. ft.

$\therefore$ Ratio of cow manure to area of land in kg and sq. ft. = 10,000 : 43,560

Size of plot = 200 ft. by 500 ft.

$\therefore$ Area of plot = 200 × 500 = 1,00,000sq. ft.

Let cow manure be x kg.

$\therefore$ Ratio of cow manure to area of plot = x : 1,00,000

These ratios are in proportion.

10,000 : 43,560 :: x : 1,00,000

$\Rightarrow \quad \frac{10000}{43560} = \frac{x}{100000}$

$\Rightarrow$ 43,560x = 10,000 × 1,00,000 = 1,00,00,00,000

$\Rightarrow \quad x = \frac{1000000000}{43560}$

$\Rightarrow$ x = 22956.84

$\therefore$ Required cow manure = 22956.84 kg = 22.95684 tonnes.

9. A tap takes 15 seconds to fill a mug of water. The volume of the mug is 500 mL. How much time does the same tap take to fill a bucket of water if the bucket has a 10 litre capacity?

Sol. Time taken by the tap for 500 mL of water = 15 seconds

$\therefore$ Ratio of volume to time = 500 : 15

We know 1 litre = 1,000 mL

10 litre = 10 × 1,000 = 10,000 mL

Let the time taken to fill a bucket of 10,000 mL be x seconds.

$\therefore$ Ratio of volume to time = 10,000 : x

These ratios are proportional.

500 : 15 :: 10,000 : x

$\Rightarrow \frac{500}{15} = \frac{10000}{x}$

$\Rightarrow$ 500x = 150,000

$\Rightarrow$ x = 300

$\therefore$ Time to fill bucket = 300 seconds

$= \frac{300}{60}$ minutes

= 5 minutes.

10. One acre of land costs ₹15,00,000. What is the cost of 2,400 square feet of the same land?

Sol. We know that 1 acre = 43,560 square feet.

$\therefore$ Cost of 43,560 sq. ft. land = ₹15,00,000

$\therefore$ Ratio of area of land to cost = 43,560 : 15,00,000

Let the cost of 2,400 sq. ft. of land be ₹x.

$\therefore$ Ratio of area of land to cost = 2,400 : x

These ratios are proportional.

$\therefore$ 43,560 : 15,00,000 : : 2,400 : x

$\Rightarrow \frac{43560}{1500000} = \frac{2400}{x}$

$\Rightarrow$ 43,560x = 2,400 × 15,00,000

$\Rightarrow x = \frac{2400 \times 1500000}{43560}$

$\Rightarrow$ x = 82,664.63

$\therefore$ Cost of land = ₹82,664.63.

11. A tractor can plough the same area of a field 4 times faster than a pair of oxen. A farmer wants to plough his 20 acre field. A pair of oxen takes 6 hours to plough an acre of land. How much time would it take if the farmer used a pair of oxen to plough the field? How much time would it take him if he decides to use a tractor instead?

Sol. Ratio of efficiency of a tractor to a pair of oxen = 4 : 1

Time taken by a pair of oxen to plough 1 acre of field = 6 hours

$\therefore$ Time taken by a tractor to plough 1 acre field = $\frac{6}{4}$ = 1.5 hours

$\therefore$ Time taken by a pair of oxen to plough 20 20-acre field = 20 × 6 = 120 hours

$\therefore$ Time taken by a tractor to plough a 20 acre field = 20 × 1.5 = 30 hours

12. The ₹10 coin is an alloy of copper and nickel called 'cupro-nickel'. Copper and nickel are mixed in a 3 : 1 ratio to get this alloy. The mass of the coin is 7.74 grams. If the cost of copper is ₹906 per kg and the cost of nickel is ₹1,341 per kg, what is the cost of these metals in a ₹10coin?

Sol. Ratio of copper and nickel in ₹10 coin = 3 : 1

Mass of one ₹10 coin = 7.74 grams

$\therefore$ Mass of copper in one ₹10 coin = $\frac{3}{3+1}\times 7.74 = \frac{3}{4}\times 7.74 = 5.805$grams

Mass of nickel in one ₹ 10 coin = $\frac{1}{3+1}\times 7.74 = \frac{1}{4}\times 7.74 = 1.935$ grams

Cost of 1 kg copper = ₹ 906

$\therefore$ Cost of 1000 grams of copper = ₹ 906

$\therefore$ Cost of 5.805 grams copper $\frac{906}{1000}\times 5.805$ = ₹ 5.26

Cost of 1 kg = ₹ 1341

$\therefore$ Cost of 1000 grams of nickel = ₹ 1341

$\therefore$ Cost of 1.935 $\frac{1341}{1000}\times 1.935$ = ₹ 2.59

$\therefore$ In one ₹10 coin, the cost of copper and the cost of nickel are respectively ₹5.26 and ₹2.59.