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SUB TOPIC: Definition , To convert a fractional ratio into a whole number ratio , To divide a given quantity into a given ratio

SUBJECT : MATHEMATICS

CHAPTER NUMBER:

CHAPTER NAME : RATIO AND PROPORTION

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LEARNING OUTCOME

- Students will be able to
- convert a fractional ratio into a whole number ratio .
- divide a given quantity into a given ratio .
- Solve problems based on it.

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PREVIOUS CONNECT

- State one of the way to compare two quantities.

Convert Fractional Ratio into Whole Number Ratio

In order to convert fractional ratio into whole number ratio,
we follow the following steps:

Step I: Find the least common multiple (L. C. M.) of the denominators.

Step II: Multiply each term of the ratio by this least common multiple (L. C. M.).

Step III: Then simplify it.

EVALUATION QUESTIONS

EXERCISE 6 A

1. Express each of the given ratios in its simplest form:

(ii) 1.5: 2.5

(iii) 6 1/4: 12 ½

(iv) 40 kg: 1 quintal

(v) 10 paise: ₹ 1

(vi) 200 m: 5 km

(vii) 3 hours: 1 day

(viii) 6 months: 1 1/3 years

(ix) 1 1/3: 2 1/4: 2 1/2

1.Solution:

(i) 22: 66

It can be written as

= 22/66

We know that the HCF of 22 and 66 is 22

Dividing both numerator and denominator by 22

= (22 ÷ 22)/ (66 ÷ 22)

So we get

= 1/3

= 1: 3

(ii) 1.5: 2.5

It can be written as

= 1.5/ 2.5

Multiplying both numerator and denominator by 10

= 15/25

We know that the HCF of 15 and 25 is 5

Dividing both numerator and denominator by 5

= (15 ÷ 5)/ (25 ÷ 5)

So we get

= 3/5

= 3: 5

(iii) 6 1/4: 12 1/2
It can be written as
= 25/4: 25/2
= 25/4 × 2/25
By further calculation
= 2/4
So we get
= 1/2
= 1: 2

(iv) 40 kg: 1 quintal
We know that
1 quintal = 100 kg
We get
= 40 kg: 100 kg
It can be written as
= 40/100
We know that the HCF of 40 and 100 is 20
Dividing both numerator and denominator by 20
= (40 ÷ 20)/ (100 ÷ 20)
So we get
= 2/5
= 2: 5

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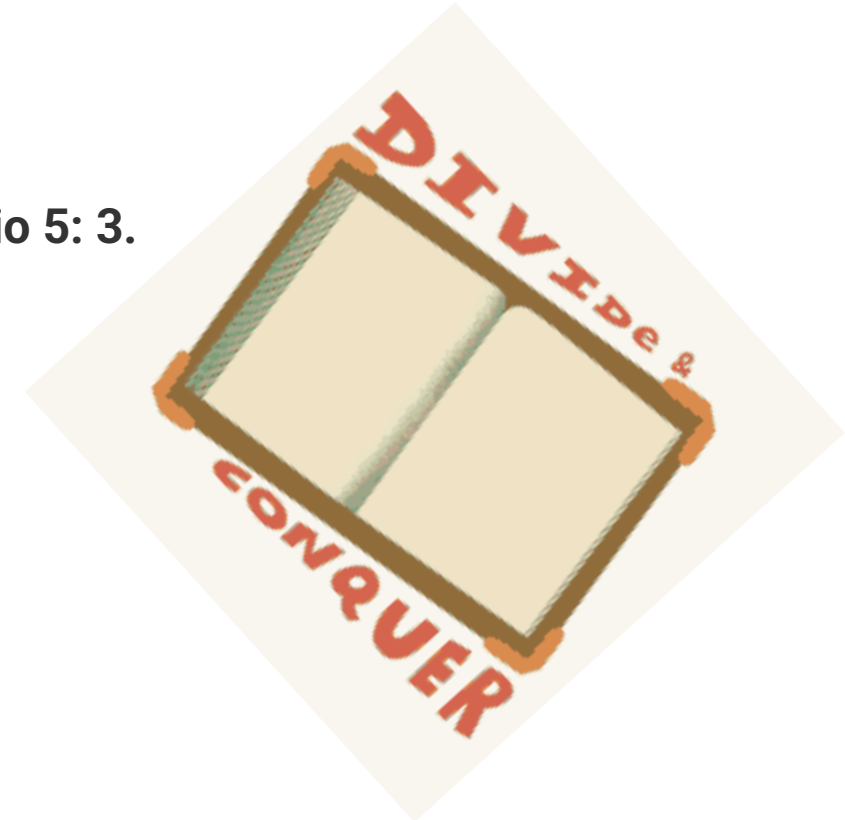
2. Divide 64 cm long string into two parts in the ratio 5: 3.



Solution:

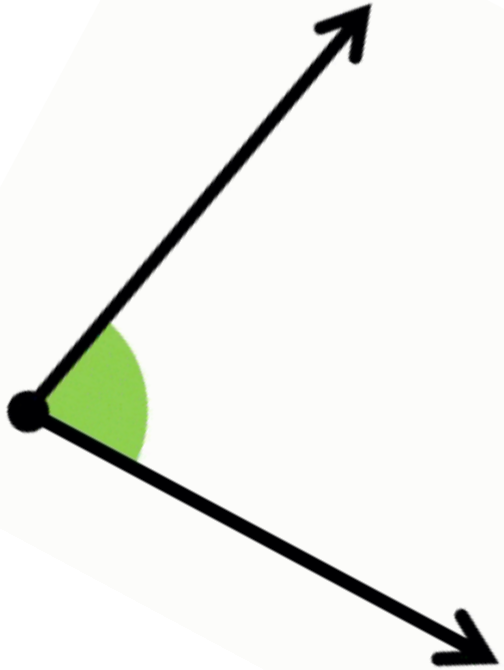
We know that

The sum of ratios = 5 + 3 = 8

So the first part = 5/8 of 64 cm = 40 cm

Similarly the second part = 3/8 of 64 cm = 24 cm

4. The angles of a triangle are in the ratio 3: 2: 7. Find each angle.



Solution:

It is given that

Ratios in angles of a triangle = 3: 2: 7

We know that

The sum of ratios = 3 + 2 + 7 = 12

In a triangle, the sum of all the angles = 180^o

So the first angle of the triangle = $3/12 \times 180^o = 45^o$

Second angle of the triangle = $2/12 \times 180^o = 30^o$

Similarly the third angle of the triangle = $7/12 \times 180^o = 105^o$

6. The sum of three numbers, whose ratios are 3 1/3: 4 1/5: 6 1/8 is 4917. Find the numbers.

Solution:

It is given that

Sum of three numbers = 4917

Ratio between the three numbers = 3 1/3: 4 1/5: 6 1/8

It can be written as

= 10/3: 21/5: 49/8

We know that the LCM of 3, 5 and 8 is 120

= (400: 504: 735)/ 120

So we get

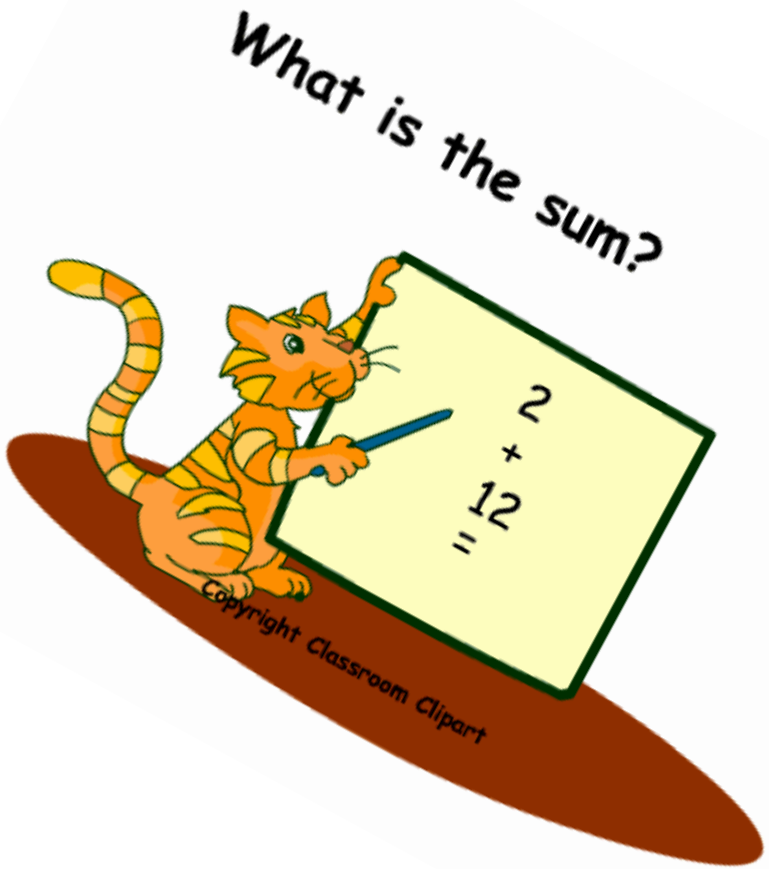
= 400: 504: 735

Here the sum of ratio = 400 + 504 + 735 = 1639

So the first number = 400/1639 of 4917 = 1200

Second number = 504/1639 of 4917 = 1512

Similarly the third number = 735/1639 of 4917 = 2205



8. Two numbers are in the ratio 5: 7. Their difference is 10. Find the numbers.

Solution:

It is given that

The ratio between two numbers = 5: 7

The difference between two numbers = 7 – 5 = 2

Here if 2 is the difference, the first number is 5

Similarly if 10 if the difference, the first number = 5/2 × 10 = 25

Second number = 7/2 × 10 = 35

12. The population of a town is 180,000, out of which males are 1/3 of the whole population. Find the number of females. Also, find the ratio of the number of females to the whole population.

Solution:

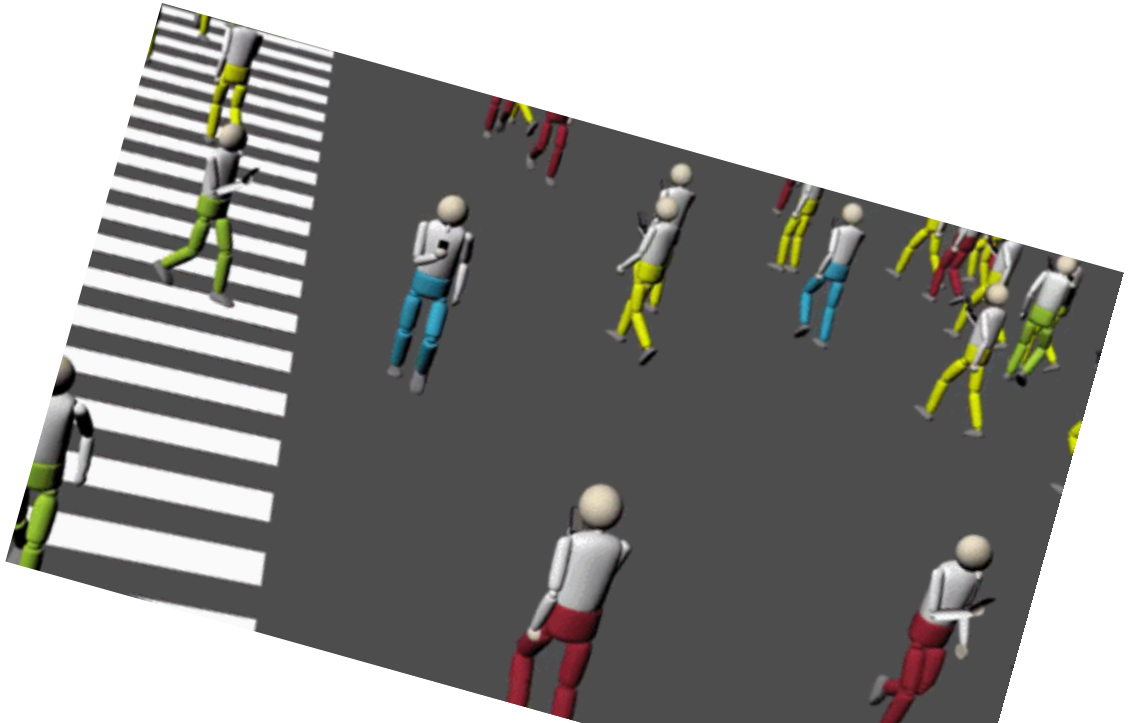
It is given that

Total population = 180000

So the population of males = 1/3 of 180000 = 60, 000

Similarly the population of females = 180000 – 60000 = 120000

Here the ratio of females to whole population = 120000: 180000 = 2: 3



13. Ten gram of an alloy of metals A and B contains 7.5 gm of metal A and the rest is metal B. Find the ratio between:
(i) the weights of metals A and B in the alloy.
(ii) the weight of metal B and the weight of the alloy.

Solution:
We know that
Total weight of A and B metals = 10 gm A weight – 7.5 gm B weight
So we get
= 10 – 7.5
= 2.5 gm
(i) Ratio between the weight of A and B in the alloy = 7.5: 2.5
It can be written as
= 75/10: 25/10
So we get
= 3: 1
(ii) Ratio between the weight of metal B and the weight of the alloy = 2.5: 10
It can be written as
= 25/10: 10
So we get
= 25: 100
= 1: 4

19. ₹ 300 is divided between A and B in such a way that A gets half of B. Find:
(i) the ratio between the shares of A and B.
(ii) the share of A and the share of B.
Solution:

Amount divided between A and B = ₹ 300
(i) We know that A gets half of B
So the ratio between the shares of A and B = ½ = 1: 2
(ii) We know that
Sum of the ratios = 1 + 2 = 3
Share of A = (300 × 1)/ 3 = ₹ 100
Share of B = (300 × 2)/ 3 = ₹ 200

21. A bag contains ₹ 1,600 in the form of ₹ 10 and ₹ 20 notes. If the ratio between the numbers of ₹ 10 and ₹ 20 notes is 2: 3; find the total number of notes in all.

Solution:

Amount in the bag = ₹ 1,600

The bag has notes in the denomination of ₹ 10 and ₹ 20

So the ratio between the number of ₹ 10 and ₹ 20 notes = 2: 3

Consider the number of ₹ 10 notes = x

Number of ₹ 20 notes = y

Using the condition

10x + 20y = 1600 …. (1)

x = 2/3 y ….. (2)

By substituting the value of x in equation (1)

10 × 2/3 y + 20y = 1600

20/3y + 30y = 1600

(20 + 60)/ 3 y = 1600

80/3 y = 1600

y = (1600 × 3)/ 80

y = 60

Substituting the value of y in equation (2)

x = 2/3 × 60 = 40

So the total number of notes in all = x + y

= 60 + 40

= 100 notes

THANKING YOU

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