

MATH



CHAPTER 9: RATIO

RATIO

LERNING OBJECTIVE

This lesson will help you to:

- ❖ Understand the concept of ratio.
- ❖ Simplify ratio and understand equivalent ratio.
- ❖ Determine and define unit rate.
- ❖ Use scale drawings to measure.

QUICK CONCEPT REVIEW

- ❖ Ratio is two things compared to each other.

For example: 60 km per hour is a ratio or 12 girls to 13 boys in a class is a ratio.

REFL – LIFE EXAMPLE

- ❖ The concept of ratio is very commonly used in cooking. A recipe has ingredients in a certain fixed ratio. For example; the ratio of flour to sugar is 3: 1.
- ❖ Builders use ratio in constructing a building. The raw material used should be in fixed ratio to construct a strong building.

PROPERTIES OF RATIO

- ❖ There are 3 ways to write a ratio, a to b; $\frac{a}{b}$ and $a : b$.
- ❖ A ratio can be scaled up.

For example:



The ratio of checkered ball: striped balls is 3:1.

AMAZING FACTS

- ❖ The ratio of length to breadth of Indian flag is 3 : 2



- ❖ The ratio of speed of sound underwater to air is 5 : 1 i.e., sound travels five times faster underwater than in air

➤ PLAY TIME

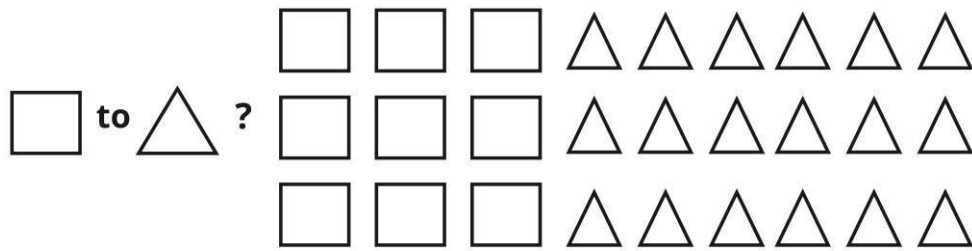
Have a bag of red balls and blue balls. Divide your friends in teams. Distribute same number of red and blue balls to all the teams. Ask the team to divide the balls in asked ratio.





The ratio of checkered ball: striped balls is $9:3 = 3:1$, even though there are more balls.




Questions:


1. What does _____? stand for? Height : feet :: age -----?-----
 - (a) Years
 - (b) Inches
 - (c) Meters
 - (d) Kilograms
2. What does _____? stand for? $5 : 35 :: 10 : \underline{\hspace{2cm}}$?
 - (a) 7
 - (b) 70
 - (c) 10
 - (d) 5
3. What is the ratio of





- (a) 3 : 1
- (b) 1 : 3
- (c) 1 : 2
- (d) 2 : 1
4. A shopkeeper sold 60 apples and mangoes in a day. The ratio of number of apples sold to the number of mangoes sold is 5:7. How many mangoes are sold?
- (a) 25
- (b) 50
- (c) 70
- (d) 35
5. Richa has 100 cm of ribbon and cuts it in the ratio of 3:7. How much shorter is the shorter piece from the longer one?
- (a) 30cm
- (b) 70cm
- (c) 50cm
- (d) 40cm
6. How many of the below shows the ratio of balls to the ratio of toy cars as 2:3?

(a)  

(b)   

(c) 

(d)  




7. If three numbers are in the ratio of 1 : 2 : 3 and their HCF is 12. then numbers are :





- (a) 4, 8, 12
- (b) 12, 24, 36
- (c) 12, 24, 30
- (d) 5, 12, 15



8. A car travels 360 km in 3 hours. How many kilometers will it travel is 5 hours?

- (a) 500km
- (b) 550km
- (c) 600km
- (d) 450km

9. What is the ratio of?

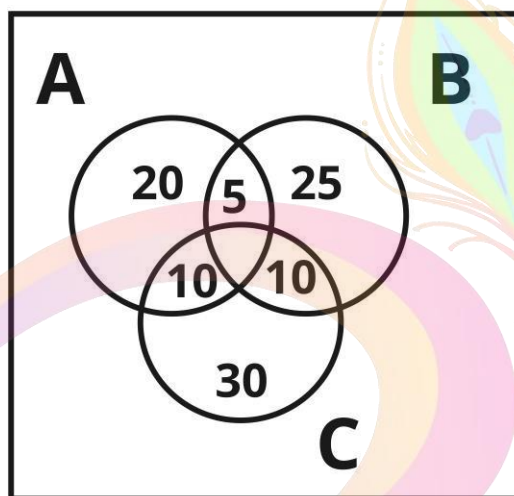
( - ) to  ?

- (a) 5 : 3
- (b) 3 : 5
- (c) 2 : 5
- (d) 5 : 2

10. The Venn diagram below shows the kind of movie 50 people would like to watch.



A → Romance

B → Comedy

C → Action

What is the ratio of the number of people who like to watch only action movies to the number of people who like to watch only comedy movies?

- (a) 7:8
- (b) 2:7
- (c) 1:1
- (d) 1:2

11. Priya bought a book for Rs. 30/- and shreya bought a book for Rs. 150/-. How many times is the cost of shreya's book to that of Priya's book?

- (a) 5 times
- (b) 4 times
- (c) 3 times
- (d) 2 times

12. The table below shows the number of fruits in a fruit stall.

Fruit	Number of fruits
Apples	70
Bananas	50
Oranges	85
Mangoes	45

What is ratio of mangoes to the total number of fruits?

- (a) 9 : 50
 - (b) 17 : 50
 - (c) 50 : 9
 - (d) 50 : 17
13. Suhana earn Rs. 800/- for 8 hours work. How long will she have to work to earn Rs. 2000/- ?
- (a) 12hrs
 - (b) 24 hrs
 - (c) 16 hrs
 - (d) 20 hrs
14. The distance between two towns A and B is 300 km. What is the distance on a map, if 30 km is shown by 1 cm?

- (a) 10cm
- (b) 5cm
- (c) 3cm
- (d) 50cm

15. Two numbers are in a ratio of 5 : 3. Their sum is 80. Find the largest number.

- (a) 40
- (b) 30
- (c) 70
- (d) 50

Answer:

1. (a)

Solution:

Feet is the unit for height. The unit for age is years.

2. (b)

Solution:

$$5 \times 7 = 35$$

$10 \times 7 = 70$ So, 70 is the correct answer.

3. (c)

Solution:

No. of squares = 9 No. of triangles = 18 Ratio of to $\Delta = \Delta = 9 : 18 = 1 : 2$.

4. (d)

Solution:

Let the number of apples sold be $5x$. Let the number of mangoes sold be

$$7x. 5x + 7x = 60$$

$$12x = 60 \quad x = 5$$

Number of mangoes sold = 35.

5. (d)

Solution:

$$3x + 7x = 100 \quad x = 10.$$

Longer piece is $7 \times 10 = 70$ cm long.

Shorter piece is $3 \times 10 = 30$ cm long.

$$\text{Difference} = 70 - 30 = 40 \text{ cm.}$$

6. (b)

Solution:

$$\frac{6}{9} = \frac{2}{3} = 2:3; \quad \frac{4}{5} = 4:5; \quad \frac{12}{8} = 3:2; \quad \frac{10}{12} = \frac{5}{6} = 5:6$$

7. (b)

8. (c)

Solution:

$$\frac{360}{3} = \frac{x}{5} \Rightarrow x = 120 \times 5 = 600 \text{Km}$$

(X is no. of km to travel in 5 hours)

9. (b)

Solution:

Number of circles = 20. Number of squares = 8. $\bigcirc - = 12$ ($\bigcirc -$) : $\bigcirc = 12 : 20 \mid = 3 : 5 \mid$.

10. (c)

Solution:

Number of people who like to watch only action movies = 14.

Number of peoples who like to watch only comedy movies = 14.

$$\text{Ratio} = 14 : 14 = 1 : 1$$

11. (a)

Solution:

$$\text{Cost of shreya's book to cost of Priya's book} = 150 : 30 = \frac{150}{30} = \frac{5}{1}$$

12. (a)

Solution:

Total number of fruits = 70 + 50 + 85 + 45 = 250 Ratio.

$$= 45 : 250 = \frac{45}{250} = \frac{9}{50} = 9 : 50$$

13. (d)

Solution:

$$8 : 800 = x : 2000 \text{ (where } x \text{ is the number of hours Suhana needs to work)} \quad \frac{8}{800} =$$

$$\frac{x}{2000} \Rightarrow x = \frac{8 \times 2000}{800} \Rightarrow 20 \text{ Hours.}$$

14. (a)

Solution:

Let x be the distance on the map $300 : x = 30 : 1$

$$\frac{300}{x} = \frac{30}{1} \Rightarrow x = 10 \text{ cm.}$$

15. (d)

Solution:

Let first number be 5x.

Let second number be 3x. $5x + 3x = 80$

$8x = 80$ $x = 10$ Substitute x to find largest number i.e., $5(10) = 50$.