Ratio and proportion

1. A sum of money is to be distributed among A, B, C, D in the proportion of 5 : 2 : 4 : 3. If C gets Rs. 1000 more than D, what is B's share? 2000
2. Seats for Mathematics, Physics and Biology in a school are in the ratio 5 : 7 : 8. There is a proposal to increase these seats by 40%, 50% and 75% respectively. What will be the ratio of increased seats? 2:3:4
3. In a mixture 60 litres, the ratio of milk and water 2 : 1. If this ratio is to be 1 : 2, then the quanity of water to be further added is: 60
4. The ratio of the number of boys and girls in a college is 7 : 8. If the percentage increase in the number of boys and girls be 20% and 10% respectively, what will be the new ratio?22
5. Salaries of Ravi and Sumit are in the ratio 2 : 3. If the salary of each is increased by Rs. 4000, the new ratio becomes 40 : 57. What is Sumit's salary?38000
6. The sum of three numbers is 98. If the ratio of the first to second is 2 :3 and that of the second to the third is 5 : 8, then the second number is:30
7. The salaries A, B, C are in the ratio 2 : 3 : 5. If the increments of 15%, 10% and 20% are allowed respectively in their salaries, then what will be new ratio of their salaries? 23 : 33 : 60
8. If 40% of a number is equal to two-third of another number, what is the ratio of first number to the second number?5:3
9. In a bag, there are coins of 25 p, 10 p and 5 p in the ratio of 1 : 2 : 3. If there is Rs. 30 in all, how many 5 p coins are there?150
10. The ratio of the number of boys and girls in a college is 7 : 8. If the percentage increase in the number of boys and girls be 20% and 10% respectively, what will be the new ratio? 21:22

Times Distance Speed

1. Ram walked from his home to the bank at the rate of 20 km/h and returned back at the rate of 5 km/h. If he took 4 hours and 30 minutes for the whole journey, find the distance of the bank from his home. 18
2. If a cyclist rides at a speed of 4 km/h, he reaches the office by 5 minutes late. However, if he rides at a speed of 5 km/h, he reaches 4 minutes earlier. Find the distance covered by him to reach office? 3
3. Two trains start from stations A and B which are 400 km apart. First train starts from A at 9.00 am and travels towards B at 50 km/h. Another train starts from B at 10.00 am and travels towards A at 40 km/h. At what time do they meet? **1.00 pm**
4. A bus without any stoppage can travel a certain distance at an average of 70km/h and with stoppages covers the same distance at an average speed of 50 km/h. How many minutes per hour does the bus stop? 17.14
5. If a train runs at 40km/hr, it reaches its destination 11 minutes late and if it runs at a speed of 50km/hr, it reaches the destination only 5 minutes late. Find the right time by which the train was to reach its destination.19
6. If a person walks at 14 km/hr instead of 10 km/hr, he would have walked 20 km more. The actual distance travelled by him is: 50
7. The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 km in 4 hours, then the speed of the first train is: 87.5
8. A man on tour travels first 160 km at 64 km/hr and the next 160 km at 80 km/hr. The average speed for the first 320 km of the tour is:71.11
9. Robert is travelling on his cycle and has calculated to reach point A at 2 P.M. if he travels at 10 kmph, he will reach there at 12 noon if he travels at 15 kmph. At what speed must he travel to reach A at 1 P.M.?12
10. It takes eight hours for a 600 km journey, if 120 km is done by train and the rest by car. It takes 20 minutes more, if 200 km is done by train and the rest by car. The ratio of the speed of the train to that of the cars is: 3:4

Partnership

1. Ravi, Kiran and Raj start a business by investing Rs.1,00,000, Rs.1,50,000 and 2,00,000 respectively. Find the share of each out of an annual profit of Rs.50,000. 11,111.11, 16,666.67, 22,222.22
2. Sam and Rita are partners in a business. Rita invests Rs.40,000 for 6 months and Sam invests Rs.45,000 for 3 months. Out of a profit of Rs.30,000, Rita’s share is \_\_\_\_ . 19,200
3. Anu, Mahesh and Naren enter into a partnership and invest Rs. 30,000, Rs. 40,000 and Rs.50,000 respectively. Mahesh withdraws Rs.20,000 at the end of first year and Naren withdraws Rs.25,000 at the end of second year. At what ratio will they share their profit at the end of 3 years. 54 : 48 : 75
4. A and B invest in a business in the ratio 3 : 2. If 5% of the total profit goes to charity and A's share is Rs. 855, the total profit is: 1500
5. A, B and C jointly thought of engaging themselves in a business venture. It was agreed that A would invest Rs. 6500 for 6 months, B, Rs. 8400 for 5 months and C, Rs. 10,000 for 3 months. A wants to be the working member for which, he was to receive 5% of the profits. The profit earned was Rs. 7400. Calculate the share of B in the profit. 2660
6. Three partners shared the profit in a business in the ratio 5 : 7 : 8. They had partnered for 14 months, 8 months and 7 months respectively. What was the ratio of their investments? 20 : 49 : 64
7. A and B started a partnership business investing some amount in the ratio of 3 : 5. C joined then after six months with an amount equal to that of B. In what proportion should the profit at the end of one year be distributed among A, B and C? 6:10:5
8. A and B started a business in partnership investing Rs. 20,000 and Rs. 15,000 respectively. After six months, C joined them with Rs. 20,000. What will be B's share in total profit of Rs. 25,000 earned at the end of 2 years from the starting of the business? 7500
9. Arun, Kamal and Vinay invested Rs. 8000, Rs. 4000 and Rs. 8000 respectively in a business. Arun left after six months. If after eight months, there was a gain of Rs. 4005, then what will be the share of Kamal?890
10. A began a business with Rs. 85,000. He was joined afterwards by B with Rs. 42,500. For how much period does B join, if the profits at the end of the year are divided in the ratio of 3 : 1? 8

Mixture

1. In what ratio must rice at Rs.12 per kg be mixed with rice at Rs.15 per kg so that the mixture be worth Rs.14 per kg? 1:2
2. How much water should be added to 50 litres of lemon extract if 2 litres of lemon extract is bought for Rs.30 and the price of the mixture should be Rs.5 per litre? 100
3. In 40 liters of a mixture of milk and water, the ratio of milk to water is 7 : 1. To make the ratio of milk to water 3 : 1, the amount of water to be added in liters is, 6 2/3
4. A metal alloy has in it Copper, Nickel and Zinc in the ratio of 5 : 2 : 3. The amount of Nickel in kg that must be added to 100 kg of alloy to have a new ratio of these three metals as 5 : 3 : 3 is,10
5. A can contains two liquids A and B mixed in ratio 4 : 1.  When 10 liters of the mixture is replaced by equal volume of liquid B, the ratio of A and B changes to 2 : 3. The volume of liquid A in liters initially was, 16
6. Tea worth Rs. 126 per kg and Rs. 135 per kg are mixed with a third variety in the ratio 1 : 1 : 2. If the mixture is worth Rs. 153 per kg, the price of the third variety per kg will be: 175.5
7. A milk vendor has 2 cans of milk. The first contains 25% water and the rest milk. The second contains 50% water. How much milk should he mix from each of the containers so as to get 12 litres of milk such that the ratio of water to milk is 3 : 5? 6,6
8. In what ratio must a grocer mix two varieties of pulses costing Rs. 15 and Rs. 20 per kg respectively so as to get a mixture worth Rs. 16.50 kg? 7:3
9. A merchant has 1000 kg of sugar, part of which he sells at 8% profit and the rest at 18% profit. He gains 14% on the whole. The quantity sold at 18% profit is:600
10. The cost of Type 1 rice is Rs. 15 per kg and Type 2 rice is Rs. 20 per kg. If both Type 1 and Type 2 are mixed in the ratio of 2 : 3, then the price per kg of the mixed variety of rice is:18

Permutation Combination

1. How many words can be formed by using the letters of the word “MATHEMATICAL”? 19958400
2. Find number of words that can be made from letters of the word “ABACUS” with a condition that “U” and “S” are always together. **120 words**
3. In how many ways can 5 students be selected from a group of 10 students? 252
4. A box contains 3 red balls, 2 yellow balls and 5 green balls. In how many ways can 3 be drawn from the box, if at least 2 green balls are to be included in the draw? 60
5. In how many different ways can the letters of the word 'LEADING' be arranged in such a way that the vowels always come together?720
6. Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?25200
7. In how many ways can the letters of the word 'LEADER' be arranged?360
8. How many 3-digit numbers can be formed from the digits 2, 3, 5, 6, 7 and 9, which are divisible by 5 and none of the digits is repeated?20
9. A box contains 2 white balls, 3 black balls and 4 red balls. In how many ways can 3 balls be drawn from the box, if at least one black ball is to be included in the draw?64
10. How many 4-letter words with or without meaning, can be formed out of the letters of the word, 'LOGARITHMS', if repetition of letters is not allowed?5040

Percentage

1. Ram’s salary is 30% more than Renu’s salary, by how much percent is Renu’s salary less than Ram? 23.07%
2. The population of the Chennai city in the year 2015 is 3,48,600. If it increases at the rate of 5% per annum, what will be its population in 2017? 3,84,332
3. The price of oil increases by 10%. By how much percent must a person reduce his consumption so that his expenditure on it does not increase? 9.09%
4. In an examination 30% of total students failed in Maths, 15% in Hindi and 5% in both. Find the percentage of those who failed in both the subjects. 60%

Profit Loss

1. Uma bought a number of roses at 4 for a rupee and an equal number at 2 for a rupee. At what price per dozen should she sell them to make a profit of 25%? 5.625
2. A man sold two bicycles at Rs.1500 each. He sold one at a loss of 23% and other at a profit of 23%. Find his profit or loss percentage. 5.29
3. A seller uses a weighing stone of 900gms instead of 1 Kg. Find his real profit percent. 11.11
4. Rahul sells a bicycle to Banu at a profit of 15%. Banu sells it to Sona at a profit of 20%. If sona pays Rs.3000 for it, then the cost price of the bicycle for Rahul is. 2173.91
5. A vendor buys 30 pencils at the marked price of 25 pencils from a wholesaler. If he sells these pencils giving a discount of 2%, then what is his profit percentage ? 17.6
6. A vendor earns a profit of 10% on selling a book at 15% discount on the printed price (marked price). The ratio of the cost price to the printed price of the book is. 17 : 22
7. In a certain store, the profit is 320% of the cost. If the cost increases by 25% but the selling price remains constant, approximately what percentage of the selling price is the profit? 70
8. A vendor bought toffees at 6 for a rupee. How many for a rupee must he sell to gain 20%? 5
9. A trader mixes 26 kg of rice at Rs. 20 per kg with 30 kg of rice of other variety at Rs. 36 per kg and sells the mixture at Rs. 30 per kg. His profit percent is:8
10. The percentage profit earned by selling an article for Rs. 1920 is equal to the percentage loss incurred by selling the same article for Rs. 1280. At what price should the article be sold to make 25% profit?2000

Numbers: Do this topic yourself

Boat Stream

1. A motorboat covers 25km upstream and 39km downstream by travelling at same speed for 8 hours. On another occasion with the same speed it covers 35km upstream and 52km downstream in 11 hours. What is the speed of the stream? 4
2. A boat travels at 9 km/h along the stream and 6 km/h against the stream. Find the speed of the boat in still water.7.5
3. A man rows downstream 30 km and upstream 12 km. If he takes 4 hours to cover each distance, then the velocity of the current is:2.25
4. A man can row 5 km/h in still water. If in a river running at 2 km an hour, it takes him 40 minutes to row to a place and return back, how far off is the place ? 1.4
5. A man can row 9 km/h in still water. It takes him twice as long to row up as to row down the river. Find the rate of the stream.3
6. Kavin can row 10 km upstream and 20 km downstream in 6 hours. Also, he can row 20 km upstream and 15 km downstream in 9 hours. Find the rate of the current and the speed of the man in still water. 2.8
7. A man takes twice as long to row a distance against the stream as to row the same distance in favour of the stream. The ratio of the speed of the boat (in still water) and the stream is:3:1
8. A boatman goes 2 km against the current of the stream in 1 hour and goes 1 km along the current in 10 minutes. How long will it take to go 5 km in stationary water? 1.5
9. A man can row at 5 kmph in still water. If the velocity of current is 1 kmph and it takes him 1 hour to row to a place and come back, how far is the place?2.4
10. A boat can travel with a speed of 13 km/hr in still water. If the speed of the stream is 4 km/hr, find the time taken by the boat to go 68 km downstream. 4