

## Ratio and Proportion:



### Basic Skills:

1. Simplify the following ratios.
  - (a) 2 : 18
  - (b) 9 : 3
  - (c) 12 : 4
  - (d) 30 : 20
  - (e) 100 : 80
  - (f) 18 : 48
  - (g) 81 : 108
  - (h) 66 : 88
  - (i) 1.7 : 51
  - (j) 1.6 : 6.4
  - (k) 12 : 20 : 16
  - (l) 30 : 45 : 55
2. Write down the following as a ratio in its simplest form.
  - (a) 12 red to 8 blue.
  - (b) 24 oranges to 15 apples
  - (c) 45 yellow to 50 black
  - (d) 80 blue to 70 green
  - (e) 100 reds to 80 blue
  - (f) 42 green to 30 white
  - (g) 60 yellow to 42 red
  - (h) 20 red to 30 blue to 25 black
  - (i) 84 blue to 60 red to 48 green.
3. For each of the following work out the cost of one.
  - (a) Seven Magazines costing £42.
  - (b) Six pairs of headphones for £672.
  - (c) Eight hats for £112.
  - (d) Five T Shirts for £88.
  - (e) 100 pens for £87.00.
  - (f) 200 rubbers for £66.
4. For each of the following you need to use the ratio to calculate the missing amount.
  - (a) There are cats and dogs in animal sanctuary of the ratio 3:5. If there are 18 cats, how many dogs are there?
  - (b) Paint is mixed at a ratio of red to blue at 5:7. If 63L of blue is used then how much red is used?
  - (c) The ratio of pens and pencils on a teacher's desk is 5:8. If there are 40 pens then how many pencils are there?
  - (d) The ratio of chairs to tables in a restaurant is 4:1. If there are 256 chairs, then how many tables are there?
  - (e) John, Ian and Colin all share money in a ratio of 3 : 4 : 6. If Ian receives £128, how much did they make altogether?

## Context Questions:

### Section 1: Calculate the missing value using the ratios

1. Andrew and David are going to split £90 in a ratio of 4:5, how much will each get?
2. In a box of stationary there is a ratio of rubbers to sharpeners of 5:11. If there are 95 rubbers, how many sharpeners are there?
3. At a wedding Chicken and Beef are being served at a ratio of 5 : 6. If there are 78 servings of beef then how many people are at the wedding in total?
4. In a classroom everyone was asked what pet they had, the ratio of pupils saying they had cats or dogs was 2:9. If 4 pupils said they had a cat how many pupils are there in the class in total?
5. Fiona and Craig are going to split money in a ratio of 13:11. If Fiona gets £403. Then how much will Craig get?
6. In their inheritance Michael who is 24 years old and Jasmine who is 28 years have £26,000 shared out to them in a ratio of their ages. How much does each person get?
7. The ratio of penguins : Monkeys : Bears in a zoo is 5 : 11 : 1.
  - (a) If there are 30 penguins then how many monkeys are there?
  - (b) If there are 121 Monkeys, how many Penguins and Bears are there in total?
  - (c) If there are 8 Bears, how many animals in total are there?
  - (d) If there are 170 animals in total then how many of each animal are there?

### Section 2: Direct Proportion

1. A robot can sort 12 boxes in 20 seconds, working at this rate how many boxes would be sorted in
  - (a) One minute
  - (b) Ten minutes
  - (c) One hour
2. Alan works for 6 hours and is paid £330. How much would he make if he worked 5 hours?
3. A hotel has 300 guests which means they need to spend £7500 to have enough food to feed them all. How much would they spend on food if they had 500 guests?
4. It costs £20 for 4 plates in a shop, how much more would you need to spend to buy 10 plates.
5. The cost of painting is directly proportional to the area being painted. A wall is 10 meters by 6 meters and costs £120 to paid. How much would it cost to paint a wall that is 15m by 9m?
6. The cost to build ceramic cuboids is directly proportional to the volume of them. The first ceramic cuboid measures 20cm by 8cm by 6cm and costs £48 to make. How much would it cost to make a ceramic cuboid that measures 16cm by 6cm by 4cm?

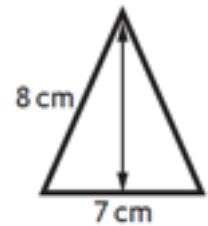
### Section 3: Indirect Proportion

1. It takes 4 men 12 hours to paint a fence in the garden, how long would it take 6 men to do it?
2. A family have enough food to feed 4 dogs for 20 days, how many full days could they feed 6 dogs?
3. It will take 40 builders 2 years to build a tower, how many men would you need to build the tower in 18 months?
4. It takes 10 people 2 hours to complete a mystery tour around London, how many people would be in the team to complete it in 1 hour and 12 minutes?
5. There is enough food on a farm to feed 400 cows for 16 days, If they increase the number of cows by 200 then how many full days could they feed them for?

### Exam Questions:

1. **Non Calculator:** A bottle of juice that is 300ml costs 75p, how much for 1 litre of that juice?
2. **Non Calculator:** A bag of flour weighing 400g costs 64p. How much for a 2.2kg bag?
3. **Non Calculator:** In a shop there are two different sizes of the same fabric softener. There is 4kg for £8.44 or 5kg for £10.80. Which is the best value for money? Justify your answer.

4. There is a triangle on the right. It is to be scaled up with a ratio of 2:5. The area of the original must be between 14% and 18% of the new triangle. Does this meet specifications?



5. A rectangle measures 5cm by 12cm. It is scaled up using a ratio of 1:3. The old area should be between 10 and 15% of the new area, does it meet specifications?
6. **Non Calculator:** A rectangle has dimensions 5cm by 8cm. Another has an area that is 1.75 times the size of this. If one dimension of that rectangle is 7cm. What is the other?
7. **Non Calculator:** Three friends share out Pokemon Cards depending on how much they each paid. The ratio for Graham, Martin and Julie is 3:7:5. If Julie received 120 cards then how much did all three of them have in total?
8. **Non Calculator:** Chris, Abbie, Cameron and Mischa buy lottery tickets every week. They each pay in the following amount  
Chris            £1.50  
Abbie            £2.50  
Cameron        £3.00  
Mischa £2.00

If they won £90,000, How much do Chris and Abbie get together?

9. **Non Calculator:** It takes 5 chefs 3 hours to make enough food for a party. How long in hours and minutes would it take 4 chefs?
10. Off the coast of Puerto Rico there is a hotel. Unfortunately for the guests staying at this hotel a storm has just hit and no one will be allowed to leave the island for a day or two. Luckily it has enough food to feed the 300 guests staying three meals a day for 12 days. If in another scenario how many days could they last for if they had 400 guests to feed?

