

GCSE 7+ Session 7
Independent Practice
Ratios, percentages and proportions

Revise, refresh, recall the core knowledge and skills:

- 1 In a school, the ratio “number of year 10 students : number of year 11 students” is 7 : 5. There are 68 more year 10 students than year 11 students.

Work out the total number of year 11 students at the school.

2

- a) A triangle has angles in the ratio 8 : 9 : 19. Is the triangle right-angled?
b) The perimeter of a rectangle is 448 cm. The ratio length : width is 9 : 7.

Work out the area of the rectangle.

3

- a) A price is reduced by 5%, and then by 20%. What is the overall price reduction?
b) An athlete goes on a training run. The next day, they go on a training run that is a 40% greater distance but they reduce their average speed by 20%. What is the percentage change in the time taken?

4

- a) It takes 9 sheep 15 days to graze a pasture of area 3 acres. How long does it take 15 sheep to graze a pasture of area 7 acres?
b) It takes 5 bears 3 hours to catch 45 salmon. How many salmon will 9 bears catch in 5 hours?

5 Before an election,

- 20% of the electorate said they would vote for candidate A
- 8% of the electorate said they would vote for candidate B
- 30% of the electorate said they would not vote. This is 2250 voters.

In the actual election, these people all voted as they said they would.

- The rest of the electorate said they were “undecided”.

In the actual election, these “undecided” voters voted for A and B in the ratio 2 : 5.
In total, how many votes did candidate B receive?

6 A farmer grows apples in the ratio “red apples : green apples” = 3 : 5.

- For red apples, the ratio “apples for eating” : “apples for cooking” is 3 : 2
- For green apples the ratio “apples for eating” : “apples for cooking” is 1 : 3

What is the overall ratio “apples for eating” : “apples for cooking”?

Practice makes permanent: these questions will help you embed and make secure your factual knowledge, procedural fluency and conceptual understanding:

- 7 A farmer grows apples in the ratio “red apples : green apples” = 3 : 5.
- For red apples, the ratio “apples for eating” : “apples for cooking” is 3 : 2
 - Overall, the ratio “apples for eating” : “apples for cooking” is 1 : 3
- What is the ratio “apples for eating” : “apples for cooking” for green apples?
- 8 7 decorators painting a wall of area 200m^2 over 5 days drink 60 litres of tea. How many litres of tea are drunk by 5 decorators painting a wall of area 420m^2 over 8 days?
- 9 A cuboid has sides in the ratio 3 : 5 : 2. The surface area is 1550 cm^2 . What is the volume?

Productive struggle: these harder questions require deeper thinking.

- 10 A farmer grows apples in the ratio “red apples : green apples” = 3 : 5.
- For red apples, the ratio “apples for eating” : “apples for cooking” is 3 : 2
 - For green apples the ratio “apples for eating” : “apples for cooking” is 1 : 3
- What fraction of the overall “apples for eating” are red?
- 11 Find three numbers which add up to a total of 150 and which have the properties:
- the ratio of the middle number to the smallest number is 7 : 3
 - the ratio of the largest number to the middle number is 5 : 4
- 12 The ratio of the sum to the difference of x and y is 7 : 1 and of z and y is 11 : 1.
What is the ratio of the sum to the difference of x and z ?
- 13 Person X donates 10% of their salary each month to charity.
Person Y donates 20% of their salary each month to charity.
The amount Y donates is 50% more than the amount X donates.
What percentage increase in Y’s salary will make it equal to X’s salary?
- 14 A and B share a whole number of £. They each get a whole number of £, and then A gives B £10. The ratio of their shares is now 3 : 2. How much might they each now have?