Ratio, Proportion and Percentages: 25 Practice Questions

11+ non-calculator practice, graded easy to hard. Answers and methods follow the questions.

Name: ..... Date: ..... Time: _____ Score: ..... / 25

> Practise without a calculator and show your working. The groups are teaching labels, not exam-board standards. Begin untimed when learning a method. Follow your school's guidance for test scope and timing.

SECTION A: CORE (QUESTIONS 1-9)

1. Write the ratio 18 : 24 in its simplest form.

2. In a box of 35 pens, the ratio of blue to red is 3 : 4. What fraction of the pens are red?

3. Share 40 sweets in the ratio 2 : 3. How many sweets are in the larger share?

4. Share £56 in the ratio 3 : 4. How much is the smaller share?

5. Find 25% of 320.

6. Find 15% of 360.

7. Write 0.35 as a fraction in its simplest form and as a percentage.

8. A recipe for 4 people uses 300 g of flour. How much flour is needed for 6 people?

9. A map has a scale factor of 5. A path measures 7 cm on the map. How long is the real path in centimetres?

SECTION B: FURTHER PRACTICE (QUESTIONS 10-20)

10. Amy and Ben share money in the ratio 3 : 4. Ben receives £6 more than Amy. How much do they share altogether?

11. Three children share 72 marbles in the ratio 1 : 2 : 5. How many does the child with the largest share get?

12. A class of 30 has boys and girls in the ratio 2 : 3. Five more boys join. What is the new ratio of boys to girls in its simplest form?

13. Concrete is mixed with cement and sand in the ratio 2 : 7. A builder has 21 kg of sand and plenty of cement. How much concrete can be made?

14. Six identical notebooks cost £7.50. What do 10 of the same notebooks cost?

15. A tap fills 18 litres in 4 minutes. How many litres does it fill in 10 minutes?

16. Find 65% of 240.

17. In a test, Priya scored 18 out of 25 and Tom scored 68%. Who did better, and by how many percentage points?

18. A shape is enlarged by scale factor 3. A side of the original measures 4.5 cm. What is the matching side of the enlargement?

19. Four painters take 9 days to paint a hall. At the same rate, how long would 6 painters take?

20. The ratio of red to yellow tulips in a bed is 5 : 3. There are 24 yellow tulips. How many tulips are in the bed altogether?

SECTION C: STRETCH (QUESTIONS 21-25)

21. A coat costs £80 and is reduced by 15% in a sale. What is the sale price?

22. A season ticket rises from £250 to £280. What is the percentage increase?

23. After a 10% reduction, a game costs £18. What was the original price?

24. A shop increases a price by 20%, then takes 20% off the new price. The final price is £96. What was the original price?

25. Two numbers are in the ratio 4 : 9. If 5 is added to each, the ratio becomes 1 : 2. Find the two numbers.

Answers and Methods

Mark the method, not just the number. A correct answer from a wrong method usually breaks on the next question.

SECTION A

1. **3 : 4.**
   Divide both sides by the highest common factor, 6.
2. **4/7.**
   3 + 4 = 7 shares, red is 4 of them. Trap answer 4/3 or 3/4: the ratio number goes on top of the TOTAL shares, not the other number.
3. **24.**
   2 + 3 = 5 parts; 40 / 5 = 8; larger share = 3 x 8 = 24. Trap answer 20: dividing by 2 because two numbers are written.
4. **£24.**
   7 parts; 56 / 7 = 8; smaller share = 3 x 8 = 24.
5. **80.**
   25% is 1/4, so 320 / 4.
6. **54.**
   10% of 360 = 36; 5% = 18; 36 + 18 = 54.
7. **7/20 and 35%.**
   0.35 = 35/100 = 7/20.
8. **450 g.**
   1 person = 300 / 4 = 75 g; 6 x 75 = 450. Trap answer 350: adding 50 g instead of multiplying by 6/4.
9. **35 cm.**
   7 x 5. Scale factor multiplies every length.

SECTION B

10. **£42.**
    The DIFFERENCE is 4 - 3 = 1 part, so 1 part = £6. Total = 7 x 6 = 42. Trap answer 6: stopping at the value of one part.
11. **45.**
    1 + 2 + 5 = 8 parts; 72 / 8 = 9; largest = 5 x 9 = 45.
12. **17 : 18.**
    Original: 5 parts, 30 / 5 = 6, so 12 boys and 18 girls. After 5 join: 17 boys, 18 girls. 17 : 18 will not simplify.
13. **27 kg.**
    Sand is 7 parts = 21 kg, so 1 part = 3 kg. Total 9 parts = 27 kg. Trap answer 21 or 6: answering the wrong quantity.
14. **£12.50.**
    One notebook = 750p / 6 = 125p; 10 x 125p = £12.50.
15. **45 litres.**
    18 / 4 = 4.5 litres per minute; 4.5 x 10 = 45.
16. **156.**
    50% = 120, 10% = 24, 5% = 12; 120 + 24 + 12 = 156.
17. **Priya, by 4 percentage points.**
    18/25 = 72/100 = 72%; 72 - 68 = 4.
18. **13.5 cm.**
    4.5 x 3. Half of 27.
19. **6 days.**

Inverse proportion: 4 x 9 = 36 painter-days; 36 / 6 = 6. Trap answer 13.5: treating it as direct proportion.

20. **64.**
    Yellow is 3 parts = 24, so 1 part = 8. Total 8 parts = 64. Trap answer 40: answering only the red tulips.

SECTION C

21. **£68.**
    10% = £8, 5% = £4, so 15% = £12; 80 - 12 = 68. Or 85% of 80.

22. **12%.**
    Increase = £30; 30/250 = 12/100 = 12%. Always divide by the ORIGINAL, not the new price.

23. **£20.**
    £18 represents 90%, so 1% = 18 / 90 = £0.20 and 100% = £20. Trap answer £19.80: adding 10% back on to £18, which uses the wrong 100%.

24. **£100.**
    After +20% then -20% the price is 1.2 x 0.8 = 0.96 of the original, so 96% = £96 and 1% = £1. The two changes do NOT cancel.

25. **20 and 45.**
    Numbers are 4n and 9n. (4n + 5) x 2 = 9n + 5 gives 8n + 10 = 9n + 5, so n = 5. Check: 25 : 50 = 1 : 2.