Ratios and proportion - topic test

15 questions | 38 marks | 45 minutes

A by-hand review from ratio notation and sharing to practical models and reasoning.

Equivalent correct methods earn the corresponding marks.

1. Use the picture to write blue:yellow. [1 mark]



3 blue counters 2 yellow counters

Count three blue and two yellow counters.

Answer: $3:2$.

2. Simplify $18:24$. [1 mark]

Divide both entries by 6.

Answer: $3:4$.

3. Simplify $50\ \text{cm}:2\ \text{m}$. [2 marks]

Convert 2 m to 200 cm.

Divide $50:200$ by 50.

Answer: $1:4$.

4. Complete $4:7=20:x$. [2 marks]

Multiply both entries by 5.

Answer: $x=35$.

5. There are 9 red beads and 6 white beads. What fraction of all beads is red? [2 marks]

There are $9+6=15$ beads.

Simplify $\frac{9}{15}$ to $\frac{3}{5}$.

Answer: $\frac{3}{5}$.

6. Share 72 dollars in the ratio $5:4$. [3 marks]

Nine parts make 72 dollars; each is 8 dollars.

Multiply by 5 and by 4.

Answer: 40 dollars and 32 dollars.

7. Rice for 4 people is 240 g. Find the rice for 10 people. [2 marks]

One person needs $\frac{240}{4}=60$ g.

Ten need $10(60)=600$ g.

Answer: 600 g.

8. Concentrate:water is $1:3$. Make 2 L of drink. Find both quantities. [3 marks]

Four parts make 2 L; one is 0.5 L.

Use one part concentrate and three parts water.

Answer: 0.5 L concentrate and 1.5 L water.

9. Complete the price table for identical notebooks. [3 marks]

Identical notebooks

Notebooks	4	6	9
Cost (dollars)	?	18	?

One notebook costs $\frac{18}{6}=3$ dollars.

Multiply the unit price by 4 and by 9.

Answer: 4 cost 12 dollars; 9 cost 27 dollars.

10. A student changes $2:5$ to $5:8$ by adding 3 to both entries. Explain why this does not give an equivalent ratio. [3 marks]

The fractions $\frac{2}{5}$ and $\frac{5}{8}$ are unequal.

Equivalent ratios require a common multiplication or division factor.

Answer: The same addition does not preserve relative amounts.

11. There are 42 bibs, blue:gold $2:5$. Gold bibs go into bags of 5. How many full bags are needed? [3 marks]

Seven parts make 42, so one part is 6.

There are $5(6)=30$ gold bibs.

$\frac{30}{5}=6$ bags.

Answer: 6 bags.

12. A map uses 2 cm for 7 km. Find the real distance for 6 cm. [2 marks]

Six centimetres is three times two.

Multiply 7 km by 3.

Answer: 21 km.

13. Hire costs 6 dollars to start plus 4 dollars per hour. Sam says 4 hours costs twice as much as 2 hours. Check the claim. [3 marks]

$6+2(4)=14$.

$6+4(4)=22$.

Twenty-two is not double fourteen; the starting fee is fixed.

Answer: False: 2 hours costs 14 dollars and 4 hours costs 22 dollars.

14. A recipe for 6 students uses 450 g pasta and 300 g vegetables. The same recipe is needed for 10 students. [4 marks]

(a) Find the pasta needed. [1 mark]

The scale factor is $\frac{10}{6} = \frac{5}{3}$.

Pasta: $450(\frac{5}{3}) = 750$ g.

Answer: 750 g.

(b) Find the vegetables needed. [1 mark]

Apply the same factor: $300(\frac{5}{3}) = 500$ g.

Answer: 500 g.

(c) Find the total mass of pasta and vegetables for 10 students. [2 marks]

Add the scaled ingredients: $750 + 500 = 1250$ g.

The combined ingredients total 1250 g.

Answer: 1250 g, or 1.25 kg.

15. Scores are in the ratio $3:7$. The higher score is 20 points more. Find both scores. [4 marks]

The difference is four parts.

Four parts make 20, so one part is 5.

Scores are $3(5) = 15$ and $7(5) = 35$.

Check the difference is 20 and the ratio simplifies to $3:7$.

Answer: 15 and 35 points.