

Foundation GCSE: Using Ratios

Name: _____

Class: _____

Instructions: Answer all questions. Questions are ordered from easiest (1) to hardest (20). Working out should be shown where appropriate.

1. The ratio of boys to girls in a club is $3 : 2$. If there are 15 boys, how many girls are there?
2. Orange squash and water are mixed in the ratio $1 : 4$. If you use 50 ml of squash, how much water is needed?
3. A recipe uses flour and sugar in the ratio $5 : 2$. If 250 g of flour is used, how much sugar is needed?
4. The ratio of red counters to blue counters is $4 : 3$. If there are 12 red counters, how many blue counters are there?
5. In a bag of sweets, the ratio of chewy to hard sweets is $2 : 5$. If there are 35 hard sweets, how many chewy sweets are there?
6. The ratio of cats to dogs in a rescue center is $3 : 4$. If there are 28 dogs, how many animals in total are there?
7. Concrete is made by mixing cement, sand, and gravel in the ratio $1 : 2 : 3$. If 6 kg of sand is used, what is the total mass of the concrete?
8. Two numbers are in the ratio $3 : 5$. If the smaller number is 21, what is the larger number?
9. The angles in a triangle are in the ratio $2 : 3 : 4$. Find the size of the largest angle.
10. A bag contains gold and silver coins in the ratio $5 : 3$. There are 24 more gold coins than silver coins. How many gold coins are there?
11. The ratio of men to women at a conference is $4 : 7$. If there are 165 people at the conference in total, how many women are there?
12. Paint is mixed using red and yellow in the ratio $3 : 5$. If 12 litres of red paint are used, how many litres of yellow paint are needed?
13. The ratio of adult tickets to child tickets sold for a show is $5 : 2$. If 140 child tickets were sold, how many adult tickets were sold?
14. In a school, the ratio of teachers to students is $1 : 15$. If there are 450 students, how many teachers and students are there altogether?
15. Copper and zinc are alloyed in the ratio $7 : 3$. If a piece of this alloy contains 21 g of copper, what is the total mass of the alloy?
16. A sum of money is shared between Anna and Ben in the ratio $3 : 4$. If Ben receives 28 more than Anna, how much does Anna receive?
17. The ratio of sheep to cows on a farm is $7 : 2$. If there are 153 animals in total, how many more sheep than cows are there?
18. The ratio of length to width of a rectangle is $5 : 3$. If the perimeter of the rectangle is 48 cm, find its area.
19. Two quantities x and y are in the ratio $4 : 9$. If x is decreased by 5 and y is increased by 5, the new ratio becomes $1 : 3$. Find the original value of y .
20. Three containers A , B , and C hold liquid in the ratio $2 : 3 : 5$. If 10 litres are moved from C to A , the ratio of liquids in A , B , and C becomes $4 : 3 : 3$. Find the total volume of liquid.

Answers & Worked Solutions

1. 10 girls
 $3 \text{ parts} = 15 \implies 1 \text{ part} = 5$. *Girls* = $2 \times 5 = 10$.
 $= 7 \times 15 = 105$.
2. 200 ml
 $1 \text{ part} = 50 \text{ ml} \implies 4 \text{ parts} = 200 \text{ ml}$.
3. 100 g
 $5 \text{ parts} = 250 \implies 1 \text{ part} = 50$. *Sugar* = $2 \times 50 = 100$.
4. 9 blue counters
 $4 \text{ parts} = 12 \implies 1 \text{ part} = 3$. *Blue* = $3 \times 3 = 9$.
5. 14 chewy sweets
 $5 \text{ parts} = 35 \implies 1 \text{ part} = 7$. *Chewy* = $2 \times 7 = 14$.
6. 49 animals
 $4 \text{ parts} = 28 \implies 1 \text{ part} = 7$. *Total parts* = 7,
 $7 \times 7 = 49$.
7. 18 kg
 $2 \text{ parts (sand)} = 6 \implies 1 \text{ part} = 3$. *Total parts* = 6, $6 \times 3 = 18$.
8. 35
 $3 \text{ parts} = 21 \implies 1 \text{ part} = 7$. *Larger* = $5 \times 7 = 35$.
9. 80°
Total parts = 9, $180^\circ \div 9 = 20^\circ$. *Largest* = $4 \times 20^\circ = 80^\circ$.
10. 60 gold coins
Difference of 2 parts = 24 $\implies 1 \text{ part} = 12$.
Gold = $5 \times 12 = 60$.
11. 105 women
Total parts = 11, $165 \div 11 = 15$. *Women*
12. 20 litres
 $3 \text{ parts} = 12 \implies 1 \text{ part} = 4$. *Yellow* = $5 \times 4 = 20$.
13. 350 adult tickets
 $2 \text{ parts} = 140 \implies 1 \text{ part} = 70$. *Adult* = $5 \times 70 = 350$.
14. 480 total
 $15 \text{ parts} = 450 \implies 1 \text{ part} = 30$. *Total parts* = 16, $16 \times 30 = 480$.
15. 30 g
 $7 \text{ parts} = 21 \implies 1 \text{ part} = 3$. *Total parts* = 10,
 $10 \times 3 = 30$.
16. 84
Difference = 1 $\text{part} = 28$. *Anna* = $3 \times 28 = 84$.
17. 85 more sheep
Total parts = 9, $153 \div 9 = 17$. *Difference* = 5
parts, $5 \times 17 = 85$.
18. 135 cm^2
Semi-perimeter = 24 *cm* ($5 + 3 = 8 \text{ parts} \implies 3 \text{ cm per part}$). *Length* = 15, *Width* = 9, *Area* = 135.
19. 45
 $\frac{4x - 5}{9x + 5} = \frac{1}{3}$
 $\implies 3(4x - 5) = 9x + 5$
 $\implies y = 45$.
20. 50 litres
Total parts = 10 ($2 : 3 : 5$). *Let volumes be* $2x, 3x, 5x$. *After move:* $2x + 10, 3x, 5x - 10$. *Ratio equality gives* $x = 5$, *total* = 50.