DIVIDING A QUANTITY IN A GIVEN RATIO

- Using fractions to divide a quantity in a given ratio:
  - Fraction of the amount required $= \dfrac{\text{number in ratio}}{\text{total number of parts}}$
  - Calculate the fraction of the amount for each share of the ratio.

  For example, share \$20 in ratio of 2 : 3.

  Fractions of the amount required are $\frac{2}{5}$ and $\frac{3}{5}$.

  Therefore $\frac{2}{5}$ of \$20 = \$8 and $\frac{3}{5}$ of \$20 = \$12.
- To find a total quantity from a given ratio:
  - Use the concept of 'parts' and the unitary method to find the value of one part and therefore the value of the total parts can be calculated.

  Or
  - Use equivalent ratios to find the value of each quantity in the ratio and then add the numbers together to find the total.

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Example 6 Dividing a quantity in a particular ratio

Divide 54 m in a ratio of 4 : 5.

SOLUTION

Unitary method

Total number of parts = 9

÷9 ↘ 9 parts = 54 m ↘ ÷9

×4 ↘ 1 part = 6 m ↘ ×4

4 parts = 24 m

×5 ↘ 1 part = 6 m ↘ ×5

5 parts = 30 m

54 m divided in a ratio of 4 : 5 is 24 m and 30 m.

EXPLANATION

Total number of parts = 4 + 5 = 9

Value of 1 part = 54 m ÷ 9 = 6 m

Check numbers add to total:

24 + 30 = 54

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Example 8 Finding a total quantity from a given ratio

The ratio of boys to girls at Birdsville College is 2 : 3. If there are 246 boys at the school, how many students attend Birdsville College?

SOLUTION

Unitary method

÷2 ↘ 2 parts = 246 ↙ ÷2

×5 ↘ 1 part = 123 ↙ ×5

5 parts = 615

615 students attend Birdsville College.

Equivalent ratios method

×123 ↘ boys : girls = 2 : 3 ↙ ×123

= 246 : 369

615 students attend Birdsville College.

EXPLANATION

Ratio of boys : girls is 2 : 3.

Boys have '2 parts' = 246

Value of 1 part = 246 ÷ 2 = 123

Total parts = 2 + 3 = 5 parts

Check: 5 parts = 5 × 123 = 615

Use equivalent ratios.

Multiply each quantity by 123.

Total number of students

= 246 boys + 369 girls = 615