ARITHMETIC (Q 1, PAPER 1)

LESSON NO. 2: RATIO & PROPORTION

2007

1 (a) Convert 164 miles to kilometres, taking 5 miles to be equal to 8 kilometres.

SOLUTION

If one quantity is **DIRECTLY PROPORTIONAL** to another, then if you multiply or divide one quantity by a number you must do the same to the other quantity.

Convert 164 miles to kilometres, taking 5 miles to be equal to 8 kilometres.

5 miles = 8 km

1 mile = $\frac{8}{5}$ km

164 miles = $\frac{8}{5} \times 164 = 262.4$ km

2006

1 (a) €320 is $\frac{4}{9}$ of a prize fund. Find the total prize fund.

SOLUTION

If one quantity is **DIRECTLY PROPORTIONAL** to another, then if you multiply or divide one quantity by a number you must do the same to the other quantity.

€320 is $\frac{4}{9}$ of a prize fund. Find the total prize fund.

$\frac{4}{9}$ of prize = €320

$\frac{1}{9}$ of prize = $\frac{€320}{4} = €80$

$\frac{9}{9}$ of prize = $€80 \times 9 = €720$

2005

1 (b) (ii) Express the ratio $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$ as a ratio of natural numbers.

Divide 325 in the ratio $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$.

SOLUTION

Multiply each fraction by the lowest common denominator which is 12.

$\therefore \frac{1}{2} : \frac{1}{3} : \frac{1}{4} = 6 : 4 : 3$

Add the three numbers: 6 + 4 + 3 = 13

First number: $\frac{6}{13} \times 325 = 150$

Second number: $\frac{4}{13} \times 325 = 100$

Third number: $\frac{3}{13} \times 325 = 75$

2002

1 (a) Copper and zinc are mixed in the ratio 19 : 6.
The amount of copper used is 133 kg.
How many kilogrammes of zinc are used?

SOLUTION

Copper and zinc are mixed in the ratio 19 : 6.
19 + 6 = 25.

$\frac{19}{25}$ of the mixture is copper and $\frac{6}{25}$ is zinc.

$\frac{19}{25}$ of mixture = 133 kg

$\frac{1}{25}$ of mixture = $\frac{133}{19}$ kg

$\frac{6}{25}$ of mixture = $\frac{133}{19} \times 6 = 42$ kg

1999

1 (a) IR£40 is divided between two pupils in the ratio 7:3. How much does each pupil get?

SOLUTION

7 + 3 = 10

First pupil: $\frac{7}{10} \times 40 = £28$

Second pupil: $\frac{3}{10} \times 40 = £12$

1998

1 (a) When a cyclist had travelled a distance of 12.6 km he had completed $\frac{3}{7}$ of his journey. What was the length of the journey?

(b) (ii) Divide 357 grammes in the ratio $\frac{1}{2} : \frac{1}{4} : 1$.

SOLUTION

1 (a)

$\frac{3}{7}$ = 12.6 km

$\frac{1}{7}$ = $\frac{12.6}{3} = 4.2$ km

$\frac{7}{7}$ = $4.2 \times 7 = 29.4$ km

1 (b) (ii)

Multiply across by 4: Ratio 2:1:4
2 + 1 + 4 = 7

First part: $\frac{2}{7} \times 357 = 102$ g

Second part: $\frac{1}{7} \times 357 = 51$ g

Third part: $\frac{4}{7} \times 357 = 204$ g

1997

1 (c) (i) The length and breadth of a rectangle are in the ratio 9:5, respectively. The length of the rectangle is 22.5 cm. Find its breadth.

SOLUTION

Ratio 9:5.

9 + 5 = 14

Length: $\frac{9}{14}$ = 22.5 cm

$\frac{1}{14}$ = $\frac{22.5}{9}$ cm

Breadth: $\frac{5}{14}$ = $\frac{22.5}{9} \times 5 \text{ cm} = 12.5 \text{ cm}$