

**ARITHMETIC (Q 1, PAPER 1)**

**2010**

**1. (a)** Express 40 metres as a fraction of 1 kilometre. Give your answer in its simplest form.

**(b) (i)** Calculate the value of

$$\frac{57.6 + 80.44}{1.3 \times 10^4}$$

and write your answer correct to three decimal places.

**(ii)** An importer buys an item for £221 sterling when the rate of exchange is €1 = £0.85 sterling.

He sells it at a profit of 14% of the cost price.

Calculate, in euro, the price for which he sells the item.

**(c) (i)** What sum of money invested at 5% per annum compound interest will amount to €8682 in 3 years?

Give your answer correct to the nearest euro.

**(ii)** A sum of € $P$  was invested at  $r\%$  per annum compound interest.

The interest for the first year was €220.

The interest for the second year was €228.80.

Calculate  $r$  and  $P$ .

**SOLUTION**

**1 (a)**

$$\text{Fraction: } \frac{40 \text{ m}}{1 \text{ km}} = \frac{40 \text{ m}}{1000 \text{ m}} = \frac{1}{25}$$

1 kilometre (km) = 1000 m  
100 centimetres (cm) = 1 m  
1000 millimetres (mm) = 1m

**1 (b) (i)**

$$\frac{57.6 + 80.44}{1.3 \times 10^4} = 0.011 \text{ [Use your calculator]}$$

**1 (b) (ii)**

$$< 1 \quad = \quad \text{£}0.85$$

$$< \frac{1}{0.85} \quad = \quad \text{£}1$$

$$< \frac{1}{0.85} \times 221 \quad = \quad \text{£}221$$

$$\therefore < 260 \quad = \quad \text{£}221$$

$$\text{Selling Price: } < 260 \times 1.14 = < 296.40$$

**STEPS**

**1.** Change the percentage to a decimal.

**2.** INCREASE: Add 1 to the decimal.

DECREASE: Subtract the decimal from 1.

**3.** Multiply the quantity by this number.

**1 (c) (i)**

$$R = 5$$

$$n = 3$$

$$A = 8682$$

$$P = ?$$

$$A = P \left( 1 + \frac{R}{100} \right)^n$$

$$8682 = P \left( 1 + \frac{5}{100} \right)^3$$

$$8682 = P(1.05)^3$$

$$\frac{8682}{(1.05)^3} = P$$

$$\therefore P = \text{€}7500$$

**1 (c) (ii)**

$\text{€}228.80 - \text{€}220 = \text{€}8.80$  [This is the amount of interest earned on  $\text{€}220$  after one year.]

$$r = \frac{8.80}{220} \times 100\% = 4\%$$

$$P \times 0.04 = 220 \Rightarrow P = \frac{220}{0.04} = \text{€}5500$$