

# 2003

## Question 1

- Q1. (a) Express 45 centimetres as a fraction of 15 metres and write your answer in its simplest form.
- (b) €6000 was invested at compound interest.  
The rate for the first year was 4% per annum.
- (i) Calculate the amount of your investment at the end of the first year.
  - (ii) At the end of the second year the investment amounted to €6520.80. Calculate the rate per annum for the second year.
- (c) The standard rate of income tax is 20% and the higher rate is 42%.  
Fiona has tax credit of €1493 for the year and the standard rate cut – off point of €30 000.  
She has a gross income of €31 650 for the year.
- (i) After tax is paid, what is Fiona's income for the year?
  - (ii) What would Fiona's gross income for the year need to be in order for her to have an after-tax income of €29 379?

## Solution

Q1. (a) Express 45 centimetres as a fraction of 15 metres and write your answer in its simplest form.

$$15 \text{ m} = 1500 \text{ cm}$$

$$\frac{45}{1500} = \frac{3}{100}$$

(b) €6000 was invested at compound interest.  
The rate for the first year was 4% per annum.

- (i) Calculate the amount of your investment at the end of the first year.
- (ii) At the end of the second year the investment amounted to €6520.80. Calculate the rate per annum for the second year.

(i) Year 1  $P_1 = 6000$ ,  $R = 4$

$$\text{Interest} = \frac{PR}{100} = \frac{6000 \times 4}{100} = 240$$

$$A_1 = 6000 + 240 = 6240$$

(ii) Year 2:  $P_2 = 6240$ ,  $A_2 = 6520.80$

Interest = amount – principal

$$= 6520.80 - 6240 = 280.80$$

$$\text{Percentage interest} = \frac{\text{interest}}{\text{principal}} \times \frac{100}{1} = \frac{280.8}{6240} \times \frac{100}{1} = 4.5\%$$

- (c) The standard rate of income tax is 20% and the higher rate is 42%.  
 Fiona has tax credit of €1493 for the year and the standard rate cut –  
 off point of €30 000.  
 She has a gross income of €31 650 for the year.

- (i) After tax is paid, what is Fiona's income for the year?  
 (ii) What would Fiona's gross income for the year need to be in  
 order for her to have an after-tax income of €29 379?

- (i) Her tax payments are split into two.  
 €30,000 at lower rate  
 €1,650 at higher rate (31,650 – 30,000)

Find 20% of €30,000 = €6,000

Find 42% of €1,650 = €693

Gross tax = €6,693

$$\begin{array}{r} \text{Gross tax} = \text{€6,693} \\ \text{Tax credits} = \text{€1,493} \\ \hline \text{Tax paid} = \text{€5,200} \end{array}$$

Take home pay = €31,650 - €5,200 = €26,450

- (ii) What would Fiona's gross income for the year need to be in  
 order for her to have an after-tax income of €29 379?

Extra income is €29,379 - €26,450 = €2,929

58% = €2,929

$$1\% = \frac{2929}{58}$$

$$100\% = \frac{2929}{58} \times \frac{100}{1} = 5050$$

Gross income = €31650 + €5,050 = €36,700