

# 2005

## Question 2

Q2 (a) (i) Write down the reciprocal of  $\frac{7}{2}$ .

(ii) Find the value of the reciprocal, correct to 2 decimal places.

(b) (i) There are 25 000 fish in a fish farm.

The number of fish in the farm increases by 40% each year.  
How many fish will be in the farm at the end of 3 years?

(ii) The monthly line rental on Peter's mobile phone amounts to €12.70.

During May, the duration of his calls is 1 hr 41 mins and 50 secs.  
Calls are charged at 0.6 cent per second.  
Calculate Peter's total bill for May.

(c) (i) The standard rate of income tax is 20% and the higher rate is 42%. Sheila has tax credits of €2700 for the year and a standard rate cut – off point of €22 000.

Sheila has a gross income of €45 000 for the year.  
Calculate the total bill payable by Sheila for the year.

(ii) Tony pays tax at the same rates as Sheila.

Tony has tax credits of €2 900 for the year and the same standard rate cut – off point as Sheila.

His total tax payable amounts to €13 680 for the year.  
Calculate Tony's gross income for the year.

## Solution

Q2 (a) (i) Write down the reciprocal of  $\frac{7}{2}$ .

(ii) Find the value of the reciprocal, correct to 2 decimal places.

(i) Reciprocal of  $\frac{7}{2} = \frac{2}{7}$

(ii)  $\frac{2}{7} = 0.285 = 0.29$

(b) (i) There are 25 000 fish in a fish farm.  
The number of fish in the farm increases by 40% each year.  
How many fish will be in the farm at the end of 3 years?

$$40\% \text{ of } 25\,000 = \frac{40}{100} \times \frac{25000}{1} = 10000$$

$$\text{End of year 1 is } 25000 + 10000 = 35000$$

$$40\% \text{ of } 35000 = \frac{40}{100} \times \frac{35000}{1} = 14000$$

$$\text{End of year 2 is } 35000 + 14000 = 49000$$

$$40\% \text{ of } 49000 = \frac{40}{100} \times \frac{49000}{1} = 19600$$

$$\text{End of year 2 is } 49000 + 19600 = 68600$$

- (ii) The monthly line rental on Peter's mobile phone amounts to €12.70.  
 During May, the duration of his calls is 1 hr 41 mins and 50 secs.  
 Calls are charged at 0.6 cent per second.  
 Calculate Peter's total bill for May.

$$1 \text{ hour} = 3600 \text{ seconds}$$

$$41 \text{ minutes} = 2460 \text{ seconds}$$

$$\text{Total time} = 3600 + 2460 + 50 = 6110$$

$$\text{Total cost} = 6110 \times 0.6 = 3666 \text{ cents} = \text{€}36.66$$

$$\text{Total bill} = \text{€}36.66 + \text{€}12.70 = \text{€}49.36$$

- (c) (i) The standard rate of income tax is 20% and the higher rate is 42%. Sheila has tax credits of €2700 for the year and a standard rate cut – off point of €22 000.  
 Sheila has a gross income of €45 000 for the year.  
 Calculate the total bill payable by Shelia for the year.

€22,000 at lower rate

€23,000 at higher rate

$$\text{Find } 20\% \text{ of } \text{€}22,000 = \text{€}4400$$

$$\text{Find } 42\% \text{ of } \text{€}23,000 = \text{€}9660$$

$$\text{Gross tax} = \text{€}14060$$

Gross tax	=	€14060
<u>Tax credits</u>	=	<u>€ 2700</u>
Tax paid	=	€11360

$$\text{Take home pay} = \text{€}45000 - \text{€}11360 = \text{€}33640$$

- (ii) Tony pays tax at the same rates as Sheila.  
Tony has tax credits of €2 900 for the year and the same standard rate cut – off point as Sheila.  
His total tax payable amounts to €13 680 for the year.  
Calculate Tony's gross income for the year.

$$\begin{array}{r} \text{Tax paid} \quad = \text{€}13680 \\ \text{Tax credits} = \text{€} 2900 \\ \hline \text{Gross tax} \quad = \text{€}16580 \end{array}$$

$$\text{His extra tax is } \text{€}16580 - \text{€}14060 = \text{€}2520$$

$$42\% = 2520$$

$$1\% = 60$$

$$100\% = 6000$$

$$\text{Gross income} = \text{€}45000 + \text{€}6000 = \text{€}51000$$