

LC 2014 (SET C): PAPER 2

QUESTION 7 (70 MARKS)

Question 7 (a)

- (i) Number of properties registered = $1.9 \times 0.9 = 1.71$ million
- (ii) Owners refused to pay as a protest against Government austerity measures.

Question 7 (b)

There is 360° in a full circle (pie).

24.9% of homeowners have properties values between €0 - €100 000.

The angle of the sector represented by the €0 - €100 000 band is $360^\circ \times 0.249 \approx 90^\circ$. Round off all angles to the nearest degree.

€0 – €100 000 band:

$$360^\circ \times 0.249 \approx 90^\circ$$

€100 001 – €150 000 band:

$$360^\circ \times 0.286 \approx 103^\circ$$

€150 001 – €200 000 band:

$$360^\circ \times 0.219 \approx 79^\circ$$

€200 001 – €250 000 band:

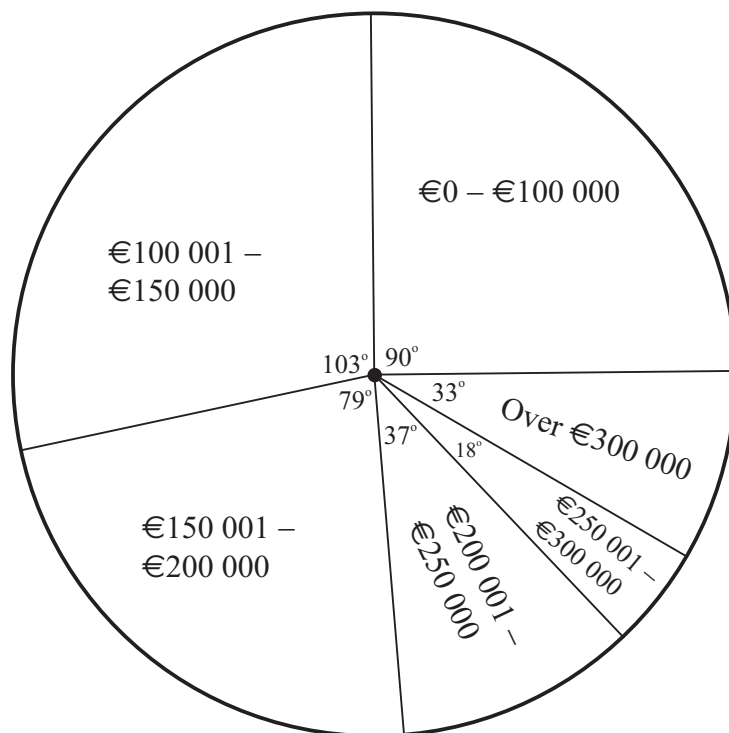
$$360^\circ \times 0.104 \approx 37^\circ$$

€250 001 – €300 000 band:

$$360^\circ \times 0.049 \approx 18^\circ$$

Over €300 000:

$$360^\circ \times 0.093 \approx 33^\circ$$



MARKING SCHEME NOTES

Question 7 (a) (i) (ii) [Scale 10C (0, 4, 7, 10)]

- 4: • Any work of merit towards estimating the number of properties registered or suggesting a partially plausible reason. e.g. 90% expressed as 0.9
- 7: • One section correct

Question 7 (b)

Angle determination [Scale 5C (0, 3, 4, 5)]

- 3: • One sector angle correct
- More than one error in the calculation of sector angle
 - Any work of merit. e.g. Correct work with percentage or use of 360
- 4: • One consistent error in the calculation of sector angle

Pie Chart [Scale 20B (0, 10, 20)]

- 10: • Any one sector indicated

Question 7 (c) (i)

Total number of registered homeowners = 1.71 million = 1 710 000

€100 001 – €150 000 : Number of properties = $1\,710\,000 \times 0.249 = 425\,790$

€100 001 – €150 000 : Number of properties = $1\,710\,000 \times 0.286 = 489\,060$

€150 001 – €200 000 : Number of properties = $1\,710\,000 \times 0.219 = 374\,490$

€200 001 – €250 000 : Number of properties = $1\,710\,000 \times 0.104 = 177\,840$

€250 001 – €300 000 : Number of properties = $1\,710\,000 \times 0.049 = 83\,790$

Over €150 000 : Number of properties = $1\,710\,000 \times 0.093 = 159\,030$

Multiply the tax per property by the total number of properties to find the tax due.

€0 – €100 000: $€45 \times 425\,790 = €19\,160\,550$

Valuation Band	Tax per property	Number of properties	Total tax due (€)
€0 – €100 000	€45	425 790	19 160 550
€100 001 – €150 000	€112	489 060	54 774 720
€150 001 – €200 000	€157	374 490	58 794 930
€200 001 – €250 000	€202	177 840	35 923 680
€250 001 – €300 000	€247	83 790	20 696 130
Over €300 000	NA	159 030	NA

MARKING SCHEME NOTES

Question 7 (c) (i)

Number of properties [Scale 5C (0, 3, 4, 5)]

3: • One correct entry.

4: • One consistent error in the calculation

Total tax due [Scale 10C (0, 4, 7, 10)]

4: • One correct entry

7: • One consistent error in the calculation

Question 7 (c) (ii)

Valuation Band	Tax per property	Number of properties	Total tax due (€)
€0 – €100 000	€45	425 790	19 160 550
€100 001 – €150 000	€112	489 060	54 774 720
€150 001 – €200 000	€157	374 490	58 794 930
€200 001 – €250 000	€202	177 840	35 923 680
€250 001 – €300 000	€247	83 790	20 696 130
Over €300 000	NA	159 030	NA

Total tax due = $19\,160\,550 + 54\,774\,720 + 58\,794\,930 + 35\,923\,680 + 20\,696\,130 = €189\,350\,010$

MARKING SCHEME NOTES

Question 7 (c) (ii) [Scale 5B (0, 3, 5)]

3: • Some addition of the correct values indicated. e.g. $(19\,160\,550 + 54\,774\,720 + \dots)$

5: • Accept a correct or consistent answer without work

Question 7 (c) (iii)

Total tax due on those properties with a valuation over €300 000:
 €241 000 000 – €189 350 010 = €51 649 990

Question 7 (c) (iv)

$$\text{Mean} = \frac{\text{Total tax}}{\text{Number of properties}} = \frac{51\,649\,990}{159\,030} \approx \text{€}325$$

Question 7 (c) (v)

Valuation Band	Tax per property	Number of properties	Total tax due (€)
€0 – €100 000	€45	425 790	19 160 550
€100 001 – €150 000	€112	489 060	54 774 720
€150 001 – €200 000	€157	374 490	58 794 930
€200 001 – €250 000	€202	177 840	35 923 680
€250 001 – €300 000	€247	83 790	20 696 130
Over €300 000	NA	159 030	NA

Find 20% of 489 060 properties: $489\,060 \times 0.2 = 97\,812$

€100 001 – €150 000: New number of properties in this band = $489\,060 - 97\,812 = 391\,248$

Tax take = $391\,248 \times \text{€}112 = \text{€}43\,819\,776$

€150 001 – €200 000: New number of properties in this band = $374\,490 + 97\,812 = 472\,302$

Tax take = $472\,302 \times \text{€}157 = \text{€}74\,151\,414$

New tax take = $\text{€}43\,819\,776 + \text{€}74\,151\,414 = \text{€}117\,971\,190$

Old tax take = $\text{€}54\,774\,720 + \text{€}58\,794\,930 = \text{€}113\,569\,650$

Extra tax = $\text{€}117\,971\,190 - \text{€}113\,569\,650 = \text{€}4\,401\,540$

MARKING SCHEME NOTES

Question 7 (c) (iii) [Scale 5B (0, 3, 5)]

3: • Writes 241 000 000 or Answer c(ii)

5: • Accept a correct or consistent answer without work

Question 7 (c) (iv) [Scale 5B (0, 3, 5)]

3: • Work of merit with any of the values [1 550 970, 159 030, 51 649 990]

Question 7 (c) (v) [Scale 5B (0, 3, 5)]

3: • Any work of merit in finding the number of properties changing band

e.g. $(0.2)(489\,060)$

• Identifies the difference in the band valuation. i.e. $(157 - 112)$

• Fully correct substitution. i.e. $[(0.2)(489\,060) \times 45]$