

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

**LESSON NO. 4: MONEY PROBLEMS INCLUDING VAT**

**2007**

1 (c) The table shows the hours Alan worked over four days.

Day	Thursday	Friday	Saturday	Sunday
Hours worked	9	9	9.5	$h$

Alan's basic rate of pay is €15.60 per hour.

He is paid one and a half times the basic rate for work on Saturday and Sunday.

(i) Calculate Alan's total pay for Thursday, Friday and Saturday.

(ii) Alan was paid a total of €702 for the four days' work.

Find  $h$ , the number of hours Alan worked on Sunday.

**SOLUTION**

Basic Rate: €15.60 per hour

Weekend rate: €15.60 × 1.5 = €23.40

1 (c) (i) Number of hours worked on Thursday and Friday at the basic rate: 18 hours

Number of hours worked on Saturday at the weekend rate: 9.5 hours

Pay for these 3 days =  $18 \times €15.60 + 9.5 \times €23.40 = €503.10$

1 (c) (ii) Total pay for 4 days = €702

Total pay for Sunday: €702 – €503.10 = €198.90

$$\therefore h \times €23.40 = €198.90 \Rightarrow h = \frac{198.90}{23.40} = 8.5 \text{ hours}$$

**2006**

1 (b) Aoife pays a fixed monthly charge of €15 for her mobile phone. This charge includes 100 free text messages and 50 minutes free call time each month. Further call time costs 28 cent per minute and additional text messages cost 11 cent each.

In one month Aoife sends 140 text messages and her call time is 2 hours.

(i) Find the total cost of her fixed charge, text messages and call time.

(ii) VAT is added to this cost at the rate of 21%.

Find the amount paid, including VAT.

**SOLUTION**

Fixed monthly charge: €15 (Includes 100 text messages and 50 minutes call time)

Call time: 28 c per minute

Text message: 11 c each

Aoife sends 140 text messages and has a call time of 2 hours.

(i) She has to pay for 40 text messages and 1 hour and 10 minutes (70 minutes) call time.

Total cost: €15 + (40 × 11c + 70 × 28c) = €15 + €24 = €39

(ii) VAT is add at 21%: Multiply previous answer by 1.21

Amount paid = €39 × 1.21 = €47.19

### 2004

- 1 (c) A faulty petrol pump actually delivers 1.02 litres of petrol for every 1 litre that the pump registers. During one day the pump registers 2650 litres.
- (i) What was the actual volume of petrol delivered?
  - (ii) Customers paid 85 cent for every litre of petrol registered.  
Find the total amount paid for the petrol.
  - (iii) If the pump had registered the correct volume delivered, how much more would have been paid?

#### SOLUTION

- 1 (c)(i) Actual volume:  $2650 \times 1.02 = 2703$  litres
- (ii) Amount paid:  $2650 \times 0.85 = \text{€}2252.50$
- (iii) Amount that should have been paid:  $2703 \times 0.85 = \text{€}2297.55$   
Extra amount that should have been received:  $\text{€}2297.55 - \text{€}2252.50 = \text{€}45.05$

### 2003

- 1 (b) The present reading on the electricity meter in John's house is 63792 units. The previous reading was 62942 units.
- (i) How many units of electricity were used since the previous reading?
  - (ii) What is the cost of the electricity used, if electricity costs 9.52 cent per unit?
  - (iii) A standing charge of €7.00 is added and VAT is then charged on the full amount. If John's total bill is €98.91, calculate the rate at which VAT is charged.

#### SOLUTION

- 1 (b)
- (i) 

Present reading	=	63792 units
Previous reading	=	62942 units
Units used	=	850 units
  - (ii) 

1 unit	costs	9.52 c
850 units	costs	$850 \times 9.52 \text{ c} = 8092 \text{ c} = \text{€}80.92$
  - (iii) Add on the standing charge:  $\text{€}80.92 + \text{€}7.00 = \text{€}87.92$   
VAT amount:  $\text{€}98.91 - \text{€}87.92 = \text{€}10.99$   
  
Rate of VAT =  $\frac{10.99}{80.92} \times 100\% = 12.5\%$

## 2002

- 1 (c) A raffle to raise money for a charity is being held.  
The first prize is €100, the second is €85, the third is €65 and the fourth is €50.  
The cost of printing tickets is €42 for the first 500 tickets and €6 for each additional 100 tickets. The smallest number of tickets that can be printed is 500.  
Tickets are being sold at €1.50 each.
- (i) What is the minimum possible cost of holding the raffle?
- (ii) If 500 tickets are printed, how many tickets must be sold in order to avoid a loss?
- (iii) If 1000 tickets are printed and 65% of the tickets are sold, how much money will be raised for the charity?

### SOLUTION

- 1 (c) First prize: €100  
Second prize: €85  
Third prize: €65  
Fourth prize: €50  
Printing costs: €42 for first 500 tickets (minimum allowed) + €6 for each additional 100 tickets  
Price of ticket: €1.50
- (i) Minimum cost of holding the raffle: Printing (€42) and prizes are the costs.  
Total prize fund: €100 + €85 + €65 + €50 = €300  
Printing costs: €42  
Total cost: €300 + €42 = €342
- (ii) You need to sell enough tickets to clear your costs of €342. Each ticket costs €1.50.
- $$\text{Minimum number of tickets} = \frac{342}{1.50} = 228$$
- (iii) 65% of 1000 tickets =  $0.65 \times 1000 = 650$  tickets  
Sales from tickets:  $650 \times 1.50 = €975$   
Printing costs:  $€42 + 5 \times €6 = €72$   
Total prize fund: €300  
Total costs:  $€72 + €300 = €372$

**1999**

1 (c) A holiday complex consists of three different types of chalet.

Chalet Type	No. of Chalets	No. of people per chalet	Weekly rent per chalet
Type A	12	5	IR£300
Type B	20	6	IR£350
Type C	14	8	IR£450

During one week in July all chalets are fully occupied.

(i) Calculate the number of people staying in the chalets at the holiday complex that week.

(ii) Calculate the total amount of rent paid for that week.

In the last week of September, a 35% discount is offered on the weekly rent of a type C chalet. Calculate the weekly rent on a type C chalet for the last week in September.

**SOLUTION**

**1 (c) (i)**

Type A: There are 12 chalets with 5 people per chalet:  $12 \times 5 = 60$  people

Type B: There are 20 chalets with 6 people per chalet:  $20 \times 6 = 120$  people

Type C: There are 14 chalets with 8 people per chalet:  $14 \times 8 = 112$  people

Total: 292 people

**1 (c) (ii)**

Type A: There are 12 chalets costing £300 per chalet:  $12 \times 300 = \text{£}3,600$

Type B: There are 20 chalets costing £350 per chalet:  $20 \times 350 = \text{£}7,000$

Type C: There are 14 chalets costing £450 per chalet:  $14 \times 450 = \text{£}6,300$

Total: £16,900

In the last week of September a 35% discount is offered on Type C chalets. This means that 65% of the price is payable.

Price:  $0.65 \times \text{£}450 = \text{£}292.50$

**1997**

- 1 (c) (ii) Tea served in a canteen is made from a mixture of two different types of tea, type A and type B. Type A costs IR£4.05 per kg. Type B costs IR£4.30 per kg. The mixture costs IR£4.20 per kg. If the mixture contains 7 kg of type A, how many kilograms of type B does it contain?

**SOLUTION**

Type A	Mixture	Type B
£4.05 per kg	£4.20 per kg	£4.30 per kg

Type A is £0.15 per kg cheaper than the mixture.

Type B is £0.1 per kg dearer than the mixture.

The ratio is  $0.15:0.1 = 3:2$

The mixture contains 7 kg of Type A.

Therefore, the mixture contains  $7 \times \frac{3}{2} = 10.5$  kg of Type B.

**1996**

- 1 (b) A tanker delivered heating oil to a school. Before the delivery the meter reading showed 11,360 litres of oil in the tanker. After the delivery, the meter reading was 7160 litres.

Calculate the cost of the oil delivered if 1 litre of oil cost 20.5p.

When VAT was added to the cost of the oil delivered, the bill to the school amounted to IR£1041.81.

Calculate the rate of VAT added.

**SOLUTION**

Number of litres:  $11,360 - 7,160 = 4,200$  litres

Cost =  $4,200 \times 20.5\text{p} = 86100\text{ p} = \text{£}861.00$

Amount of VAT paid =  $\text{£}1041.81 - \text{£}861.00 = \text{£}180.81$

Rate of VAT =  $\frac{\text{£}180.81}{\text{£}861.00} \times 100\% = 21\%$