JUNIOR CYCLE MATHS · FREE REVISION SHEET

Money: bills, VAT, profit & loss

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Learning outcomes (2018 specification): N.2c, U.6. Play the game: **leim.ie/shop-keeper.html**

1. Receipts and bills

Multiply each line first (3 × €1.25 = €3.75), then add the lines. **Change** = what you paid − the total. **Phone plans:** monthly charge + only the extras **over** the allowance. **Call-out charges:** fixed charge + hourly rate × hours.

2. Electricity and gas bills

Units used	present − previous = 24 015 − 23 415 = **600**
Cost of units	600 × €0.28 = €168.00
+ standing charge	€168.00 + €19.50 = **€187.50**
+ VAT at 9%	€187.50 × 1.09 = €204.375 → **€204.38**

The standing charge is a fixed amount you pay whatever you use.

3. VAT

VAT is a tax added to the price. In Ireland the standard rate is **23%**; lower rates include **13.5%** and **9%**. The question always tells you the rate.

Add VAT: €400 × 1.23 = **€492**. **Before VAT:** €492 is 123%, so €492 ÷ 1.23 = **€400**. Never take 23% off €492 (that gives €378.84).

4. Discounts and sales

25% off €80 → €80 × 0.75 = **€60**. Price before the sale: €60 ÷ 0.75 = **€80**.

5. Profit and loss

Profit = selling price − cost price (negative = a **loss**).

% profit on the cost price = profit ÷ **cost** × 100. Bought €40, sold €50: 10 ÷ 40 × 100 = **25%**.

Selling price: cost €40 at 25% profit → €40 × 1.25 = €50. **Back to the cost:** €50 ÷ 1.25 = €40.

6. Mark-up and margin Higher Level

	Profit as a % of…	€60 → €75
Mark-up	the **cost** price	15 ÷ 60 = **25%**
Margin	the **selling** price	15 ÷ 75 = **20%**

The margin is always the smaller one. Margin 40% on a cost of €54: cost = 60% of the selling price, so €54 ÷ 0.6 = **€90**.

7. Value for money

Compare the price of the **same amount**: per 100 g, per litre or per item. 500 g for €3.40 = 68c per 100 g; 1.25 kg for €8 = 64c per 100 g, so the big bag is **better value**. "3 for the price of 2" = 33⅓% off. For plans, work out each total for **this** person.

Exam tip: write every line with € signs (units used, cost, standing charge, subtotal, VAT, total): each step earns marks. Give money to the nearest cent. Going backwards? **Divide** by 1.23, 0.75 or 1.25.

PRACTICE · 34 QUESTIONS

Have a go

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A. Bills and receipts

1. Receipt: 3 × €1.45, 2 × €2.80 and 1 × €4.99. What is the total? _____
2. You pay for the shopping in question 1 with a €20 note. How much change do you get? _____
3. Electricity: previous reading 23 415, present reading 24 015. Units cost 28c and the standing charge is €19.50. Find the bill before VAT. _____
4. Add VAT at 9% to the bill in question 3. Give the total to the nearest cent. _____
5. A phone plan costs €20 a month and includes 200 minutes. Extra minutes cost 12c each. Ciarán uses 265 minutes. Find his bill. _____
6. A plumber charges a call-out charge of €70 plus €48 an hour. The job takes 2.5 hours. Find the bill. _____

B. VAT and discounts

7. A bike costs €80 before VAT. Find the price including VAT at 23%. _____
8. Find the VAT at 13.5% on a hotel bill of €250. _____
9. A TV costs €615 including VAT at 23%. Find the price before VAT. _____
10. A meal costs €218 including VAT at 9%. How much of that is VAT? _____
11. A €90 jacket is reduced by 20%. Find the sale price. _____
12. A lamp costs €45 after 25% off. What was the price before the sale? _____
13. What number do you multiply by to add VAT at 13.5%? _____
14. A €400 TV has VAT at 23% added, then 10% is taken off the total in a sale. Find the sale price. _____

C. Profit and loss

15. A shop buys a hurley for €35 and sells it for €49. Find the profit. _____
16. Bought for €40, sold for €50. Find the % profit on the cost price. _____
17. Bought for €80, sold for €68. Find the % loss on the cost price. _____
18. A phone costs a shop €120. It is sold at a profit of 30% on the cost price. Find the selling price. _____
19. A car cost €2,500 and is sold at a loss of 12%. Find the selling price. _____
20. A shop sells a jacket for €91, making 30% profit on the cost price. Find the cost price. _____
21. *Higher Level:* Bought for €16, sold for €20. Find the mark-up. _____
22. *Higher Level:* Bought for €16, sold for €20. Find the margin. _____

D. Value for money

23. A 750 g box of cereal costs €3.60. Find the cost of 100 g. _____
24. Which is better value: 400 g for €2.20 or 1 kg for €5.20? _____
25. You need 3 notebooks at €4 each. Which is cheaper: "3 for the price of 2" or "30% off each"? _____
26. A 500 ml bottle costs €1.10 and a 2 litre bottle costs €3.80. How much do you save buying one 2 litre bottle instead of four 500 ml bottles? _____
27. Gym A: €30 a month. Gym B: €8 a month plus €3.50 a visit. Éabha goes 7 times a month. Which is cheaper, and by how much? _____
28. A bus fare is €2.40 each way. A weekly ticket is €21. How much do you save over 5 school days (there and back) with the weekly ticket? _____
29. A pack of 6 yoghurts costs €4.50. One yoghurt on its own costs 80c. How much cheaper is each yoghurt in the pack? _____
30. *Higher Level:* A shop buys a lamp for €54 and wants a margin of 40%. Find the selling price. _____

Questions 31–34 are on the next page.

EXAM-STYLE · THEN CHECK

Exam corner + answers

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E. Exam-style questions (show your work)

31. **The electricity bill.** The meter read 61 052 at the start of the period and 61 902 at the end. Units cost 33c each and the standing charge is €42.30. VAT at 9% is added to the whole bill. (a) How many units were used? (b) Find the bill before VAT. (c) Find the total bill, to the nearest cent.

32. **The candle stall.** Róisín buys 50 candles for €4.20 each. She sells 35 for €9 each and the rest at 30% off. (a) What did the candles cost her? (b) What is the sale price of one candle? (c) Find her profit and her % profit on the cost price.

33. **The laptop.** A laptop costs €738 including VAT at 23%. (a) Find the price before VAT. (b) How much VAT is paid? (c) Orla says "take 23% off €738". What answer does she get, and why is she wrong?

34. **Phone cases.** *Higher Level:* A shop buys phone cases for €6 and sells them for €15. (a) Find the mark-up and the margin. (b) Which offer is better value for a customer: "2 for €25" or "3 for €36"? Explain.

Answers

A	1. €14.94 · 2. €5.06 · 3. €187.50 · 4. €204.38 · 5. €27.80 · 6. €190.00
B	7. €98.40 · 8. €33.75 · 9. €500.00 · 10. €18.00 · 11. €72.00 · 12. €60.00 · 13. 1.135 · 14. €442.80
C	15. €14.00 · 16. 25% · 17. 15% · 18. €156.00 · 19. €2,200.00 · 20. €70.00 · 21. 25% · 22. 20%
D	23. 48c · 24. 1 kg (52c v 55c per 100 g) · 25. 3 for 2 (€8.00 v €8.40) · 26. 60c · 27. Gym A, by €2.50 · 28. €3.00 · 29. 5c · 30. €90.00
E	31. (a) **850** (b) 850 × €0.33 = €280.50, + €42.30 = **€322.80** (c) VAT €29.05, total **€351.85** · 32. (a) **€210.00** (b) **€6.30** (c) income €315 + 15 × €6.30 = €409.50; profit **€199.50** = **95%** · 33. (a) €738 ÷ 1.23 = **€600.00** (b) **€138.00** (c) €568.26: 23% must be of the price BEFORE VAT, not of €738 · 34. (a) mark-up **150%**, margin **60%** (b) €12.50 v **€12.00** each: **3 for €36**

Got one wrong? Check: did you use the units USED (not the meter reading)? Did you add the standing charge? Going back to the price before VAT or before a sale, did you DIVIDE? For % profit, did you divide by the COST price? For best buys, did you compare the same amount of each? Then play **Shop Keeper** at leim.ie/shop-keeper.html: the "Go back over these" list at the end shows the rule for each mistake.

All questions written by Léim. Léim is independent and not connected with the State Examinations Commission or the NCCA. VAT rates are examples; the exam always tells you which rate to use.