



Aberdare Community School  
Mathematics Department

WJEC GCSE  
**Higher – Calculator**  
Number

## **Utility bills**

Name: .....

Set: .....

Date: .....

Teacher: .....

3. Mrs Evans received an electricity bill from Wales Electricity Company. The bill, with some of the entries removed, is shown below.

Use the information given on the bill to complete **all** of the missing entries and calculate the total amount that Mrs Evans has to pay.

<b>Wales Electricity Company</b>		<i>Bill period 31<sup>st</sup> July 2009 to 30<sup>th</sup> November 2009</i>			
Mrs Evans 34 Beach Road Aber AB34 7JG					
<b>INVOICE</b>					
Meter reading last time	Meter reading this time	Tariff C-Customer reading E-Estimated reading	Units used	Price of each unit in pence	Amount £
<b>47645C</b>	<b>48745C</b>	Units used	.....	14.2	.....
		Quarterly charge			34.88
		Total charge before V.A.T.			.....
		V.A.T. at 5% of the total charge			.....
		<b>Total charge including V.A.T.</b>			.....
		Previous balance carried forward. Credit (CR)			12.00 (CR)
		Amount to pay			.....

Working

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3. Mr Lucas received an electricity bill from R.H.T. Electricity Company. The bill, with some of the entries removed, is shown below.

Use the information given on the bill to complete all of the missing entries and calculate the total amount that Mr Lucas has to pay.

<b>R.H.T. Electricity Company</b>					
<i>Bill period 31<sup>st</sup> January 2010 to 1<sup>st</sup> May 2010</i>					
Mr Lucas 3 Hill Road Cwm CM34 7XX					
INVOICE					
Meter reading last time	Meter reading this time	Tariff C-Customer reading E-Estimated reading	Units used	Price of each unit in pence	Amount £
<b>4318C</b>	<b>4878C</b>	Units used	.....	23.2	.....
		Quarterly charge			28.88
		Total charge before V.A.T.			.....
		V.A.T. at 5% of the total charge			.....
		<b>Total charge including V.A.T.</b>			.....
		Previous amount owing			12.00
		Amount to pay			.....

Working.

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3. (a) Mrs Ridgley is considering changing her electricity supplier from **B Line Utilities** to **Domestic Utilities**.  
She usually uses 2400 units each year.  
She has found the following information.

<b>B Line Utilities:</b> standing charge 15.07p per day cost per unit 11.51p
<b>Domestic Utilities:</b> standing charge 15.82p per day cost per unit 11.32p

Should Mrs Ridgley change her supplier?

You must show **all** your working and give reasons for your answer based on the possible savings made on her yearly bill.

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(b) Mrs Ridgley finds out later on, that VAT at 5% is payable on the cost of the standing charge and the units used.  
Would this affect her decision? You must give a reason for your answer.

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7. *You will be assessed on the quality of your written communication in this question.*

A person's Taxable Income is calculated as follows.

**Taxable Income = Gross Income – Pension Contribution – Other Allowances**

Rafael has a Gross Income of £57 500 and pays a Pension Contribution of £5175.  
His Other Allowances total £7475.

Rafael pays tax at the rate of 20% on the first £35 000 of his Taxable Income, and at a rate of 40% on the rest of his Taxable Income.

Calculate the total amount of tax that Rafael pays.

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10. An electricity company uses the following formula to calculate how much to charge its customers.

$$\text{Charge} = (\text{FR} - \text{IR}) \times 11.29\text{p} + \text{D} \times 13.35\text{p} - \frac{1}{4} \text{AB}$$

A customer was charged £174.16.

Calculate, to the nearest penny, the **Annual Bonus (AB)** for this customer when the

- **Initial meter reading (IR)** was 45238
- **Final meter reading (FR)** was 46740
- **Days at standard charge (D)** was 91

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2. (a) *You will be assessed on the quality of your written communication in this part of the question.*

Valley Water Company measures the water used by a household in cubic metres.

There is a quarterly standing charge of £7.45.

The first 25 cubic metres of water used are charged at a rate of 93 pence per cubic metre.

All further water used is charged at the rate of 132 pence per cubic metre.

Calculate the quarterly water bill for a household using 46 cubic metres of water.

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- (b) A different water company, Trevi Water, has a different scale of charges.

Trevi Water:

- Quarterly standing charge £4
- First 10 cubic metres per quarter at £1.50 per cubic metre
- All further water charged at £2 per cubic metre

Write down, in its simplest form, an expression for the quarterly bill in pounds for a Trevi Water customer who uses  $x$  cubic metres of water, where  $x > 10$ .

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- (c) Mr and Mrs Alston recycle the water from their bath and washing machine to use in their garden.  
Their meter reading, in cubic metres, on 1<sup>st</sup> April was 1678 and on 30<sup>th</sup> June it was 1702.  
They recycled 8 cubic metres of the water used between 1<sup>st</sup> April and 30<sup>th</sup> June.  
Find the percentage of the water that they recycled in the quarter.

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2. You will be assessed on the quality of your written communication in this question.

Ellen has received her gas bill for the period January to April.  
The details of the bill are as follows.

- Number of units of gas used is 9745.
- The cost of one unit of gas is 2.12 pence.
- The number of days in this period is 90.
- The Standing Charge is 12.4p per day.
- VAT at 5% is charged on the total gas bill.

Find, showing all your calculations, the cost of Ellen’s gas bill including VAT.

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6. *You will be assessed on the quality of your written communication in this question.*

Karen has the following information for the last financial year.

Taxable income = Total income received – Personal allowance

Tax rates:   20% of taxable income up to £35 000  
              40% of taxable income over £35 000

- Her total income for the year was: £24 000 from a pension scheme  
  and   £20 600 from other work.
- Her personal allowance for the year was £7475.

Karen suspects that she has paid too much income tax for the last financial year.

The amount of tax Karen actually paid was 20% of her **total** income.

Check whether or not Karen's suspicion is correct.

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1. An electricity bill, for a period of three months, showed that 1380 units had been used at a cost of 12.3 pence per unit.  
The standing charge for this period was £13.86.  
VAT at 5% is payable on the total cost of the units used and the standing charge.

Calculate the total amount to be paid.

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9. A gas company uses the following formula to calculate how much to charge its customers.

$$\text{charge (in pence)} = (U \times 11.546 + D \times 31.48) \times 1.05$$

The number of units of gas used by a customer is **U** and the number of days in the billing period is **D**.

A customer was charged £165.53 over a billing period of 90 days.  
Calculate the number of gas units this customer used during this period.

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5. Claudia was given the following information.

UK Income Tax

April 2013 to April 2014

taxable income = gross income – personal allowance

- personal allowance is £9205
- basic rate of tax: 20% on the first £32 255 of taxable income
- higher rate tax: 40% is payable on all taxable income over £32 255

During the tax year 2013 to 2014, Claudia’s gross income was £52 250.

Calculate the total amount of tax that Claudia should pay.  
You must show all your working.

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3. You will be assessed on the quality of your written communication in this question.

Bethan’s current annual salary is £30 000.  
After tax and other deductions, she receives 70% of this salary.  
Over one year, her work involves travelling 8000 miles.  
Her car travels 40 miles per gallon, and a gallon of petrol costs £6.25.

She is considering a new job, working from home.

Her new salary would be  $\frac{2}{3}$  of her current salary, with the same percentage deduction.

Find the difference, in terms of money, that this change of job would make.  
You must show all of your calculations.

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9. A gas company uses the following information to calculate Hywel’s monthly payment.

- Hywel is expected to use 18 000 units of gas this year
- For the first 2000 units of gas used, he will be charged 6·883p per unit
- For the remaining units of gas used, he will be charged 2·987p per unit
- VAT of 5% is to be charged

Calculate Hywel’s **monthly** payment, correct to the nearest penny.  
Show all your working.

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Monthly payment = £ .....

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