Surname StemUp Model Solution	Centre Number	Candidate Number
Other Names		0

GCSE

3310U20-1

A18-3310U20-1

MATHEMATICS – NUMERACY
UNIT 2: CALCULATOR-ALLOWED
FOUNDATION TIER

THURSDAY, 8 NOVEMBER 2018 – MORNING

1 hour 30 minutes

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**6**	
2.	**12**	
3.	**9**	
4.	**6**	
5.	**5**	
6.	**6**	
7.	**3**	
8.	**11**	
9.	**7**	
Total	**65**	

ADDITIONAL MATERIALS

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the continuation page at the back of the booklet. Question numbers must be given for the work written on the continuation page.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

In question **3**, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

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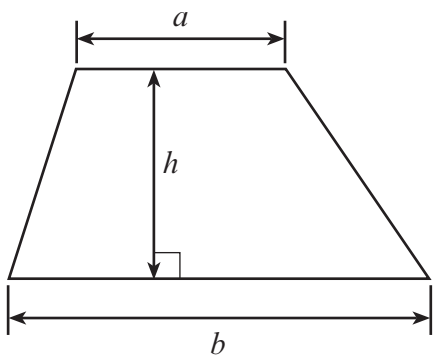
Formula List - Foundation Tier

Area of trapezium $= \frac{1}{2}(a + b)h$



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1. Stereophonics is a Welsh rock band from Cwmaman, South Wales.
The following facts were found on the internet about the band.

Kelly Jones, the lead singer and guitarist of the band, was born on 3 June 1974	The song *Dakota* spent a total of 44 weeks in the UK Singles Chart
In January 2018, Stereophonics had 931511 followers on *Facebook*	In 2016, Stereophonics sold all the tickets for a concert at Wrexham Racecourse in just 10 minutes

Use the facts above to answer the following questions.

(a) How old is Kelly Jones? [1]

2018 – 1974 = 44 (his birthday in June has passed)

44 years old

(b) Write down, in words, the number of followers Stereophonics had on *Facebook* in January 2018. [1]

Nine hundred and thirty-one thousand, five hundred and eleven

(c) In how many seconds did Stereophonics sell all the tickets for the concert at Wrexham Racecourse?
Circle your answer. [1]

60 seconds 2640 seconds 6000 seconds 600 seconds 264 seconds

10 minutes = 10 × 60 = 600 seconds

(d) How many **days** did *Dakota* spend in the UK Singles Chart? [1]

44 weeks = 44 × 7 = 308 days

308 days

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(e) A song written by Stereophonics is called *A Thousand Trees*.

David has a thousand trees.
He wants to plant the trees in rows.
He wants 73 trees in each row.
How many **full** rows of trees can David plant? [2]

1000 ÷ 73 = 13.698...

73 × 13 = 949 trees, 73 × 14 = 1022 (more than 1000)

So 13 full rows (51 trees left over)

13 rows

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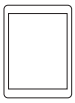
2. In the UK, in 2016, four popular social networking websites were used.
A website listed approximately how many people used them.
Some of the information can be found in the table and pictogram below.

- The number of people who used *Twitter* was half of the number of people who used *Facebook*.
- Four million more people used *Instagram* than used *Snapchat*.

Website	UK users (millions)
Facebook	32
Twitter	16
Snapchat	10
Instagram	14

KEY:  represents 8 million UK users

Website				
Facebook				
Twitter				
Snapchat				
Instagram				

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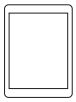
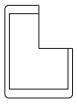
(a) In the pictogram,  represents 8 million UK users.

How many UK users does  represent?

Circle your answer. [1]

7 million 4 million 5 million 6 million 2 million

(b) Complete the missing information in the table and the pictogram. [6]

Space for working:

Facebook = 4 × 8 = 32 million, Twitter = 32 ÷ 2 = 16 million

Instagram = 10 + 4 = 14 million

Twitter: 16 ÷ 8 = 2 symbols, Snapchat: 10 ÷ 8 = 1¼ symbols

Instagram: 14 ÷ 8 = 1¾ symbols

(c) Approximately 65 640 000 people lived in the UK in 2016.

Rahman believes that more than half of the people who lived in the UK in 2016 used *Facebook*.

Is Rahman correct?

Yes ☐ No ☑

Give a reason for your answer. [1]

Half of 65 640 000 = 65 640 000 ÷ 2 = 32 820 000

32 000 000 Facebook users is less than 32 820 000,

so less than half of the people used Facebook.

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(d) Five friends recorded the number of minutes they spent using social networking websites in **a week** (including Saturday and Sunday).

The results are shown in the table below.

Alfie	Catrin	Elsie	Lowri	Lionel
525 minutes	210 minutes	870 minutes	420 minutes	480 minutes

Are the statements below true or false?
You must show all your working.

(i) Elsie spent more than 15 hours using social networking websites that week.

TRUE ☐ FALSE ☑ [2]

15 hours = 15 × 60 = 900 minutes

Elsie spent 870 minutes

870 < 900 (870 ÷ 60 = 14.5 hours)

So the statement is false.

(ii) The **mean** number of minutes Alfie spent using social networking websites each day that week was 75.

TRUE ☑ FALSE ☐ [2]

1 week = 7 days

Mean = 525 ÷ 7 = 75 minutes

So the statement is true.

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3. *In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

Mrs Davies has a rectangular garden.
The width of the garden is 5·4 m.
The length of the garden is 9 m.

She wants to place fence panels around **three** sides of the garden, as shown in the diagram below.
Each fence panel is 1·8 m long and costs £18.69.

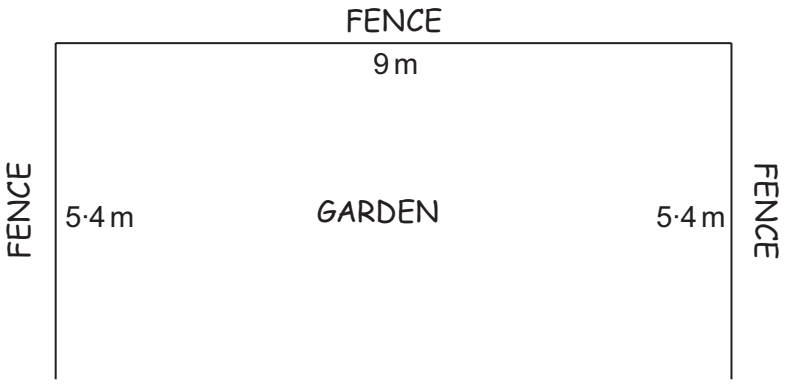

Diagram not drawn to scale

Find the total cost of the fence panels for the three sides of the garden.
Give your answer correct to the nearest pound (£).
You must show all your working. [7 + 2 OCW]

Total length of fence for the three sides:

5.4 m + 9 m + 5.4 m = 19.8 m

Number of fence panels needed:

19.8 ÷ 1.8 = 11 panels

Cost of the panels:

11 × £18.69 = £205.59

Correct to the nearest pound, £205.59 = £206

The total cost of the fence panels for the three sides of the garden is £206 (to the nearest pound).

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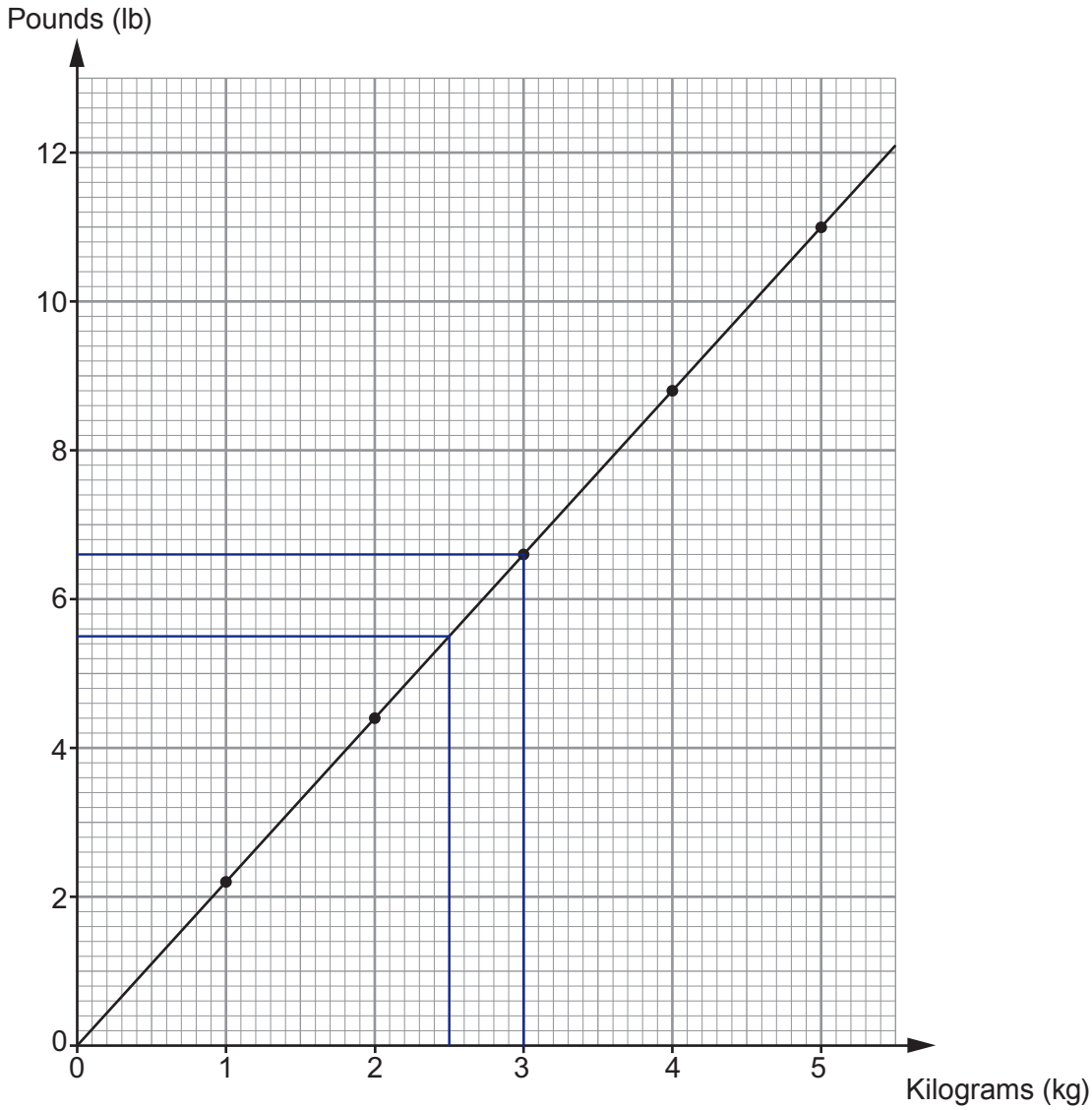
4. The following conversion graph can be used to convert between kilograms (kg) and pounds (lb).



(a) Use the graph to convert 2·5 kg into pounds (lb).
Circle your answer. [1]

5·5 lb 4·75 lb 5·25 lb 1·1 lb 1·4 lb

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Griff is a chef.
In Griff's restaurant, customers can decide whether they want their roast beef cooked *rare*, *medium* or *well done*.

Griff weighs the piece of beef he is to cook and then uses the following formulae to calculate its cooking time.

Cooking time *(rare)* = 20 minutes per lb + 20 minutes
Cooking time *(medium)* = 25 minutes per lb + 25 minutes
Cooking time *(well done)* = 30 minutes per lb + 30 minutes

(b) A 4 lb piece of beef is to be cooked **rare**.
Calculate the cooking time in minutes. [2]

Cooking time = 20 × 4 + 20

= 80 + 20

= 100 minutes

(c) A **3 kg** piece of beef is to be cooked **well done**.
Calculate the cooking time in minutes. [3]

From the graph, 3 kg = 6.6 lb

Cooking time = 30 × 6.6 + 30

= 198 + 30

= 228 minutes

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5. *(a)*

T-shirt	Pair of shoes
Was £46	Was £43.60
Now **22% off** in the sale	Now $\frac{3}{8}$ **off** in the sale

(i) Calculate the sale price of the T-shirt. [2]

22% of £46 = 0.22 × 46 = £10.12

Sale price = £46 − £10.12

= £35.88

(ii) Calculate the sale price of the pair of shoes. [2]

43.60 ÷ 8 = 5.45

3/8 of £43.60 = 5.45 × 3 = £16.35

Sale price = £43.60 − £16.35

= £27.25

(b) Before the sale, a pair of jeans cost £43.
In the sale, the jeans cost £37.
By what fraction have the jeans been reduced in the sale?
Circle your answer. [1]

$\frac{37}{43}$ $\frac{43}{37}$ $\frac{6}{43}$ $\frac{6}{37}$ $\frac{37}{6}$

Reduction = £43 − £37 = £6, so 6/43 of the original price

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6. Mixing 200 ml of white paint with 10 ml of red paint and 5 ml of blue paint makes light purple paint.

Paint is sold in tins of size 250 ml, 500 ml and 1 litre.

Jana is going to make some light purple paint.
She does not want to have any white, red or blue paint left over.
Jana wants to buy as **few tins of paint as possible**.

She buys a 250 ml tin of blue paint.

How many tins of paint will Jana need to buy altogether?
Complete the table below. [6]

Blue: 250 ml ÷ 5 ml = 50, so she makes 50 lots of the mix

Red needed = 50 × 10 ml = 500 ml, so one 500 ml tin

White needed = 50 × 200 ml = 10 000 ml = 10 litres

Fewest tins of white: 10 litres ÷ 1 litre = 10 tins of 1 litre

Total = 1 + 1 + 10 = 12 tins

Colour of paint	Size of tin	Number of tins
Blue	250 ml	1
Red	500 ml	1
White	1 litre	10
		Total number of tins of paint = 12

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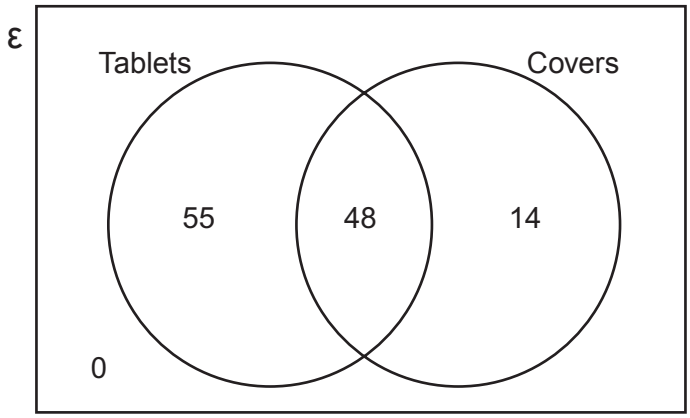
7. *Airand Electronics* only sells digital tablets and covers.

The Venn diagram shows the number of items sold by *Airand Electronics* during the first week in May.



Each tablet was sold for £220.
Each cover was sold for £18.

How much money in total did *Airand Electronics* take in the first week of May?

You must show all your working. [3]

Tablets sold = 55 + 48 = 103

Money from tablets = 103 × £220 = £22 660

Covers sold = 48 + 14 = 62

Money from covers = 62 × £18 = £1116

Total money = £22 660 + £1116 = £23 776

Airand Electronics took £23 776 in the first week of May.

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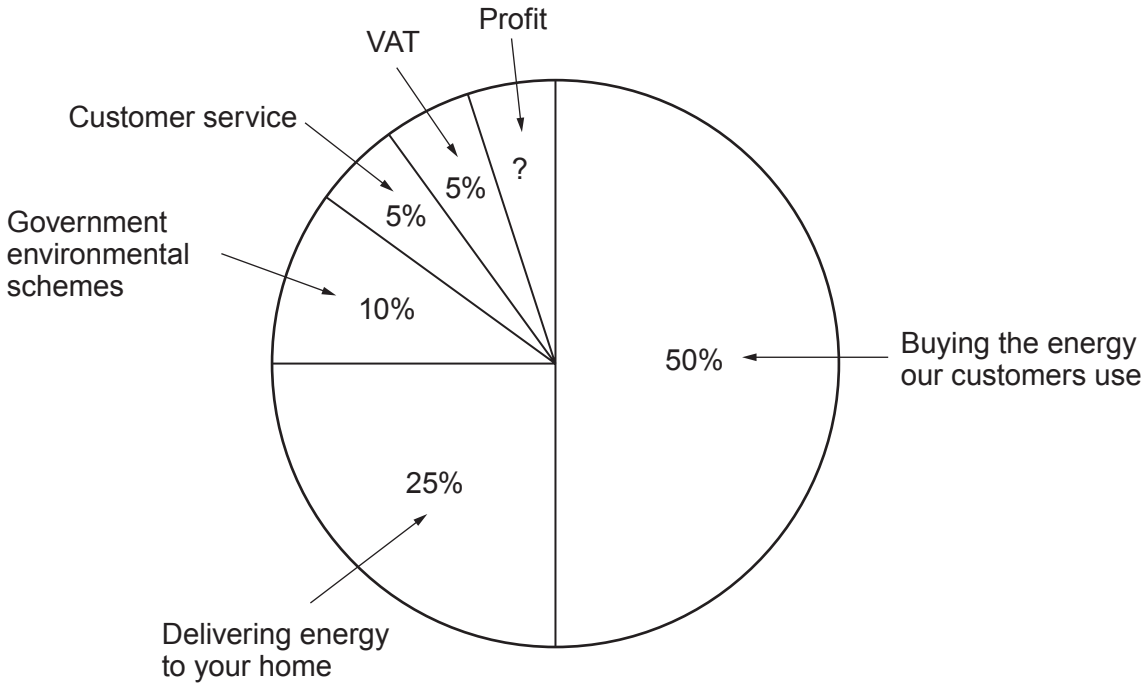
8. *(a)* *Rushmoore Energy* is a company that supplies electricity.
Last year, *Rushmoore Energy* displayed the following information in a pie chart.



The pie chart represents a total of £9100 million.

How much profit did *Rushmoore Energy* make last year?
Give your answer in millions of pounds. [3]

Profit = 100% − 50% − 25% − 10% − 5% − 5% = 5%

5% of £9100 million = 0.05 × 9100

= £455 million

Profit £ 455 million

(b) Last year, *Rushmoore Energy* had 8·58 million customers.
The previous year, *Rushmoore Energy* had 8·21 million customers.
How many extra customers were there last year?
Circle your answer. [1]

37 000 370 000 3 700 000 0·37 37 000 000

8.58 − 8.21 = 0.37 million = 370 000

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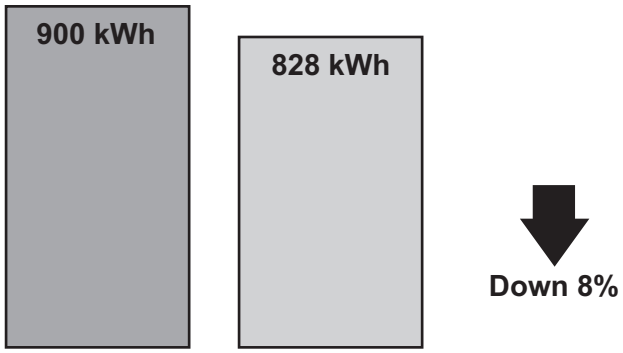
(c) Maggie looks at the back of her electricity bill.
It shows how much energy she used last period and this period.
This is the display she sees.



Is this decrease of 8% correct for the reduction in kWh?
You must show all your working to support your answer. [2]

Yes ✓ No ☐ Can't tell ☐

Reduction = 900 − 828 = 72 kWh

Percentage decrease = 72 ÷ 900 × 100

= 8%

Yes, the decrease of 8% is correct.

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(d) Maggie used 828 kWh of electricity this period.
Electricity was charged at £0.18 per kWh.
The standing charge for this period was £65.
VAT at 5% is payable on the total cost of the electricity used and the standing charge.
Calculate Maggie's electricity bill.
You must show all your working. [5]

Cost of electricity = 828 × £0.18 = £149.04

Electricity + standing charge = £149.04 + £65 = £214.04

VAT at 5% = 0.05 × £214.04 = £10.702

Total bill = £214.04 + £10.702 = £224.742

(check: 1.05 × £214.04 = £224.742)

Total bill = £224.74 (to the nearest penny)

Maggie's electricity bill is £224.74.

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9. Zara is paid in dollars.
Last year, Zara's total income before tax was $25 000.

The tax bands, taxable income and tax rates last year were as follows:

Band	Taxable income	Tax rate
Personal Allowance	Up to $10 000	0%
Basic rate	$10 000 to $22 000	20%
Higher rate	over $22 000	25%

(a) Show that Zara should have paid $2400 tax at the basic rate. [2]

Income taxed at basic rate = $22 000 − $10 000 = $12 000

Tax at 20% = 0.20 × $12 000

= $2400, as required

(b) Zara's **total** tax bill last year was $4000.
She thinks an error has been made.
Calculate how much tax should be refunded to Zara.
You must show all your working. [5]

First $10 000 is tax free (0%) = $0

Basic rate tax (from (a)) = $2400

Income taxed at higher rate = $25 000 − $22 000 = $3000

Higher rate tax = 0.25 × $3000 = $750

Total tax she should pay = $2400 + $750 = $3150

Refund = $4000 − $3150 = $850

Zara's tax refund is $ 850

END OF PAPER

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Question number	Additional page, if required. Write the question number(s) in the left-hand margin.	Examiner only

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