

# Level 2 Functional Skills Mathematics

## Sample paper 1

**Duration: 1 hour 45 minutes**

**This is the time permitted for the whole paper which has two sections.**

**Section 1 is worth 15 marks**

**Section 2 is worth 45 marks**

**Make sure you allow enough time for both Sections.**

### Section 1 – Non-calculator

Candidate name (first, last)

First

Last

Candidate enrolment number

Date of birth (DDMMYYYY)

Assessment date (DDMMYYYY)

Centre number

Candidate signature and declaration\*

**\*I declare that I had no prior knowledge of the questions in this assessment and that I will not share information about the questions.**

**You should have the following for this assessment:**

- a pen with black or blue ink
- a pencil
- an eraser
- a 30cm ruler.



**You must NOT use a protractor.**

**You must NOT use a calculator for Section 1.**

#### General instructions

- Read through each question carefully.
- Write all your answers in this booklet.
- Check your calculations and check that your answers make sense.
- You must hand this section in before you can pick up your calculator to begin Section 2.

These materials are draft and subject to  
Technical Evaluation by Ofqual

## Section 1 – Non-calculator

There are **15** marks available in this section.

You should check all your work as you go along.

You must **not** use a calculator in this section.



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**Q1.**

What is  $\frac{2}{3}$  as a percentage? Give your answer rounded to two decimal places.

\_\_\_\_\_ %

**(1 mark)**

**Q2.**

What is 14% of 200?

\_\_\_\_\_

**(1 mark)**

**Q3.**

$$2\frac{1}{2} + 3\frac{3}{4} =$$

*(tick one box)*

A   $5\frac{1}{4}$

B   $5\frac{4}{6}$

C   $6\frac{1}{4}$

D   $6\frac{4}{6}$

**(1 mark)**

**Q4.**

What is 75 as a fraction of 125? Give your answer in its simplest form.

$$\frac{\square}{\square}$$

**(1 mark)**

**Q5.**

$$\frac{1}{2} - \frac{2}{7} =$$

Give your answer in its simplest form.

$$\frac{\square}{\square}$$

**(1 mark)**

**Q6.**

$$(8 + 2 \times 6)^2 =$$

\_\_\_\_\_

**(1 mark)**

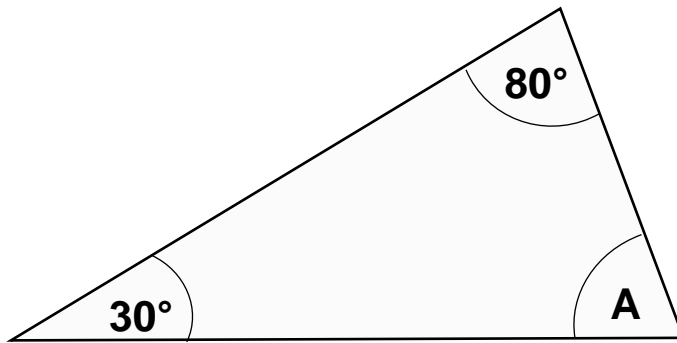
**Q7.**

What is the value of  $3ab$  when  $a = 5$  and  $b = 6$ ?

\_\_\_\_\_

**(1 mark)**

Q8.



Calculate the size of angle A.

\_\_\_\_\_°  
(1 mark)

Q9.

$$900 + 1500 \div 300 =$$

\_\_\_\_\_  
(1 mark)

Q10.

$$147.206 - 95.438 =$$

\_\_\_\_\_  
(1 mark)

Q11.

A car can travel 480 miles on a full tank of petrol. The tank holds 60 litres.  
A driver fills the tank and sets off on a journey.

How many litres of petrol will be left when the car has travelled 360 miles?

\_\_\_\_\_ litres  
(1 mark)

**Q12.**

The probability that a salesperson will get an order from a visit to a customer is  $\frac{1}{4}$   
She has 2 visits tomorrow.

What is the probability that she will get orders from **both** visits tomorrow?

Give your answer as a fraction in its simplest form.

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(1 mark)

**Q13.**

This table shows the change in the number of employees in different departments of a company compared with last year.

Department	Change compared with last year
Admin	-1
Design	0
Production	+4
Packing	+2
Warehouse	-1
Marketing	-3

What is the **total** change in the number of employees compared with last year?

(tick one box)

- A.  1 fewer  
B.  1 more  
C.  11 fewer  
D.  11 more

(1 mark)

**Q14.**

This table shows the annual salaries of the employees in a department.

Salary (in £ thousands)
16
23
23
22
15.5
18.5
20
23
36

Work out the median salary for the department.

£ \_\_\_\_\_ thousand  
(1 mark)

**Q15.**

The distance between two villages on a map measures 6.2 centimetres.

The map has a scale 1:25 000

What is the actual distance between the two villages in **kilometres**?  
**Give your answer to 2 decimal places.**

\_\_\_\_\_ km  
(1 mark)

**End of Section 1.**

**When you have finished you MUST hand this booklet in to the invigilator before you pick up your calculator to start Section 2.**

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# Level 2 Functional Skills Mathematics

## Sample paper 1

**Duration: 1 hour 45 minutes**

**This is the time permitted for the whole paper which has two sections.**

**Section 1 is worth 15 marks**

**Section 2 is worth 45 marks**

### Section 2 – Calculator

Candidate name (first, last)

First

Last

Candidate enrolment number

Date of birth (DDMMYYYY)

Assessment date (DDMMYYYY)

Centre number

Candidate signature and declaration\*

- If you have used any additional answer sheets write the number of additional sheets in this box.
  - Please ensure that you **staple** additional answer sheets to the **back** of this booklet, clearly labelling them with your full name, enrolment number, centre number and date in **BLOCK CAPITALS**.
  - You must use a black or blue pen. You may use a pencil for charts and diagrams.
- \*I declare that I had no prior knowledge of the questions in this assessment and that I will not share information about the questions.**

**You should have the following for this assessment**

- a pen with black or blue ink.
- a pencil
- an eraser
- a 30cm ruler.

**You may use a calculator for Section 2.**



**You must NOT use a protractor.**

#### General instructions

- Read through each question carefully.
- Show your working out (where required).
- Write all your working out and answers in this booklet.
- Check your calculations and check that your answers make sense.
- There are additional pages at the back of this booklet if you run out of space or ask the invigilator if you need additional sheets of paper.

## Section 2 – Calculator

There are **45** marks in this section.

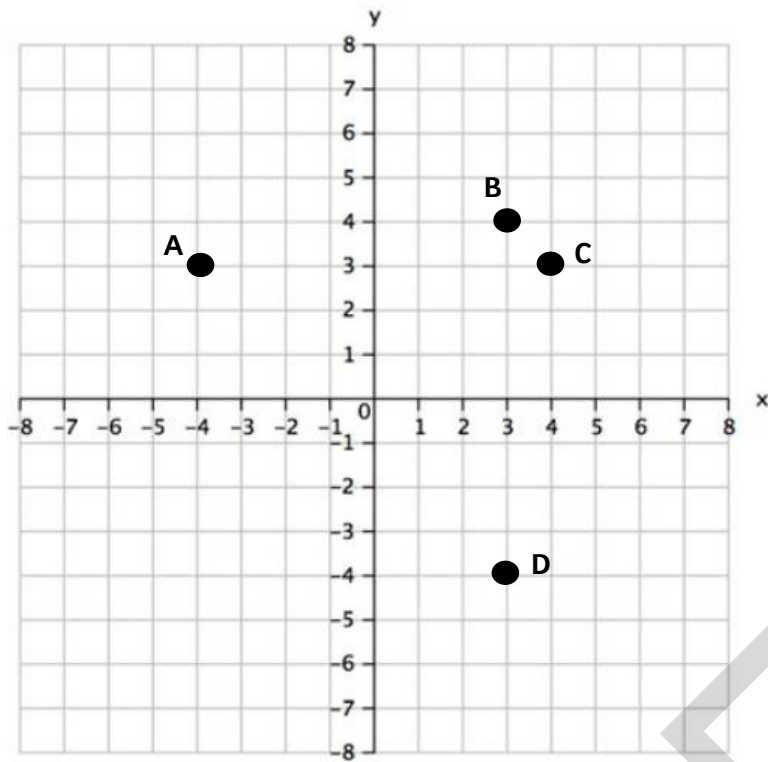
You should check all your work as you go along.

You may use a calculator.



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Q1.



Which point is at (3,4)?

(tick one box)

- A.  Point A
- B.  Point B
- C.  Point C
- D.  Point D

(1 mark)

**Q2.**

1 gallon = 4.546 litres

10 litres in gallons is approximately

*(tick one box)*

- A.  0.45 gallons  
B.  2.2 gallons  
C.  45.5 gallons  
D.  22 gallons

**(1 mark)**

**Q3.**

155	125	145	90	125	150	155
90	100	125	178	95	125	180

What is the mode of these numbers?

\_\_\_\_\_ **(1 mark)**

**Q4.**

Which one of the following lists is in increasing order?

*(tick one box)*

- A.  0.1013 0.0827 0.0095  
B.  0.1013 0.0095 0.0827  
C.  0.0095 0.1013 0.0827  
D.  0.0095 0.0827 0.1013

**(1 mark)**

**Q5.**

The surface area of a sphere is  $4\pi r^2$

A sphere has a radius ( $r$ ) that measures 3cm

Use  $\pi = 3.142$

or  $\pi = \frac{22}{7}$

Work out the surface area of the sphere to the nearest  $\text{cm}^2$ .

- A.   $15\text{cm}^2$   
B.   $22\text{cm}^2$   
C.   $113\text{cm}^2$   
D.   $1\,421\text{cm}^2$

(1 mark)

**Q6.**

A man is going to New York for work. He wants to book a hotel online.

A friend says

'Remember the booking website will show the price in dollars. It will actually cost **more pounds** than the price shown, because of the exchange rate.'

The man checks the exchange rate because he thinks his friend is wrong. He thinks that the number of pounds will be **less** than the number of dollars shown.

Exchange rate  $\pounds 1 = \$1.24$

Who is right, the man or his friend?  
Explain your answer.

**Explanation**

(1 mark)

**Q7.**

A newspaper report says that a company made £700,000 profit last year.  
It says this was 12% more than the year before.

Work out how much profit the company made the year before.

Show all your working

Profit £ \_\_\_\_\_

**(3 marks)**

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Q8.

### Income tax

Everyone can earn a certain amount of money without paying tax. This is called a Personal Allowance. They must pay tax on any earnings over this allowance.

<b>Income tax Personal Allowance, 2018/2019</b>	£11 850
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This formula gives the amount of Income tax a person pays in a year

$$T = 0.2 (y - p)$$

where T = income tax **for the year**  
y = money earned per **year**  
p = Personal Allowance

A caterer earns £1 375 per **month**.

How much income tax will she pay for the **year**?

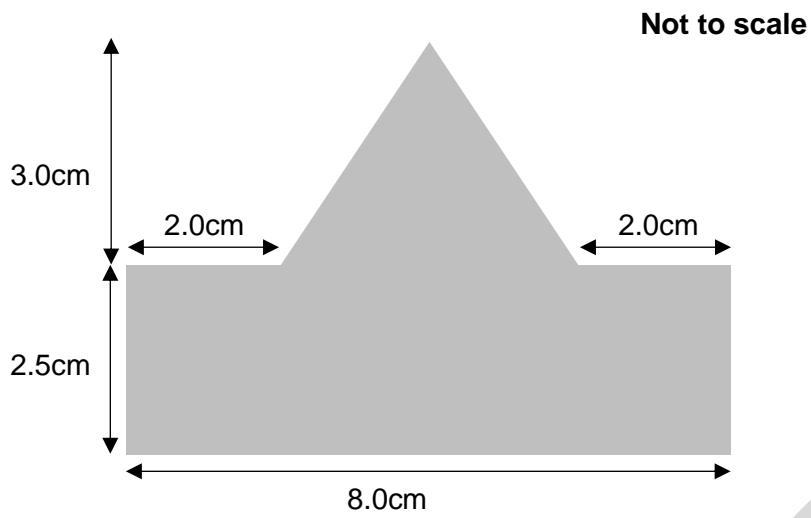
Show all your working.

£ \_\_\_\_\_

(4 marks)

**Q9.**

A worker has to set a machine to cut this shape from a piece of metal.



What is the area of the shape?

Show all your working.

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\_\_\_\_\_ cm<sup>2</sup>

**(4 marks)**



**Q10.**

This table shows information about the number of photos a photographer's customers ordered last week.

Photos ordered	Number of customers
0 - 9	30
10 - 19	10
20 - 29	8
30 - 39	2
40 - 49	0
50 - 59	0

What was the average number of photos per customer?  
**Give your answer to the nearest whole number.**

Show all your working

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\_\_\_\_\_ photos

**(4 marks)**

**Q11.**

This table shows how much a garage pays its staff.

Pay rates	
Working day	Rate
Monday to Friday	Normal rate
Saturday or Sunday	1¼ x normal rate

Last week, a mechanic worked 7½ hours each day from Monday to Saturday. She did not work on Sunday.

Her normal rate of pay is £10.80 an hour.

Work out her **total** pay for last week.

Show all your working

£ \_\_\_\_\_

Use approximation to check your answer.

Do your check here

**(4 marks)**

**Q12.**

A woman applies for a new job that pays £8.50 a week more (after tax).

She will work 5 days a week and drive to work, as she does in her job now.  
The new job is 6 miles further from her house.

**Her car travels 8.5 miles per litre of petrol  
Petrol costs £1.26 per litre**

Will the woman be better off with the new job after she takes the petrol into consideration?

Explain your answer. Include calculations to support your decision.

**Decision (yes/no)** \_\_\_\_\_

**Explanation and supporting calculations**

**(4 marks)**

**Q13.**

Your boss needs you to make some travel arrangements for him.

He will travel to Hull **4 days** every week for the next 6 months (26 weeks).

He needs to arrive at Hull at 8:30am and catch the train home at 5pm each day.

**TRAIN TICKET PRICE INFORMATION**

TRAINS TO HULL

**TICKET TYPE:**

DAY RETURN	£8.00
OFF-PEAK* DAY RETURN	£6.20

**SEASON TICKETS VALID FOR:**

ONE WEEK	£29.60
ONE MONTH	£113.70
ONE YEAR	£1 184.00

**(Price for season ticket covers all travel while the ticket is valid)**

\* **OFF-PEAK** tickets are not valid for travel between 0700 and 0900 or between 1500 and 1900

Which ticket type do you recommend?

**Recommendation**

Explain your reasons. Include figures or calculations to support your decision.

**Explanation and supporting calculations**

**(5 marks)**

**Q14.**

A company has made some changes to the way its employees work.

The manager wants to know if these changes have made any difference to the number of days employees take off work because of illness.

She can't just compare the total days as there are fewer people working in each department after the changes.

She gives you this information about the employees in one department.

Number of days each employee took off sick in the year BEFORE the changes			
14	12	11	8
12	0	15	6
11	3	10	7
0	5	8	10
15	16	14	3

Number of days each employee took off sick in the year AFTER the changes		
12	0	2
11	3	7
14	10	10
3	8	9
8	4	4

Did the changes make any difference to the average number of days that employees took off sick?

Explain your findings to the manager. Show calculations to support your explanation.

**Decision (yes/no)** \_\_\_\_\_

**Explanation and supporting calculations**

**(5 marks)**

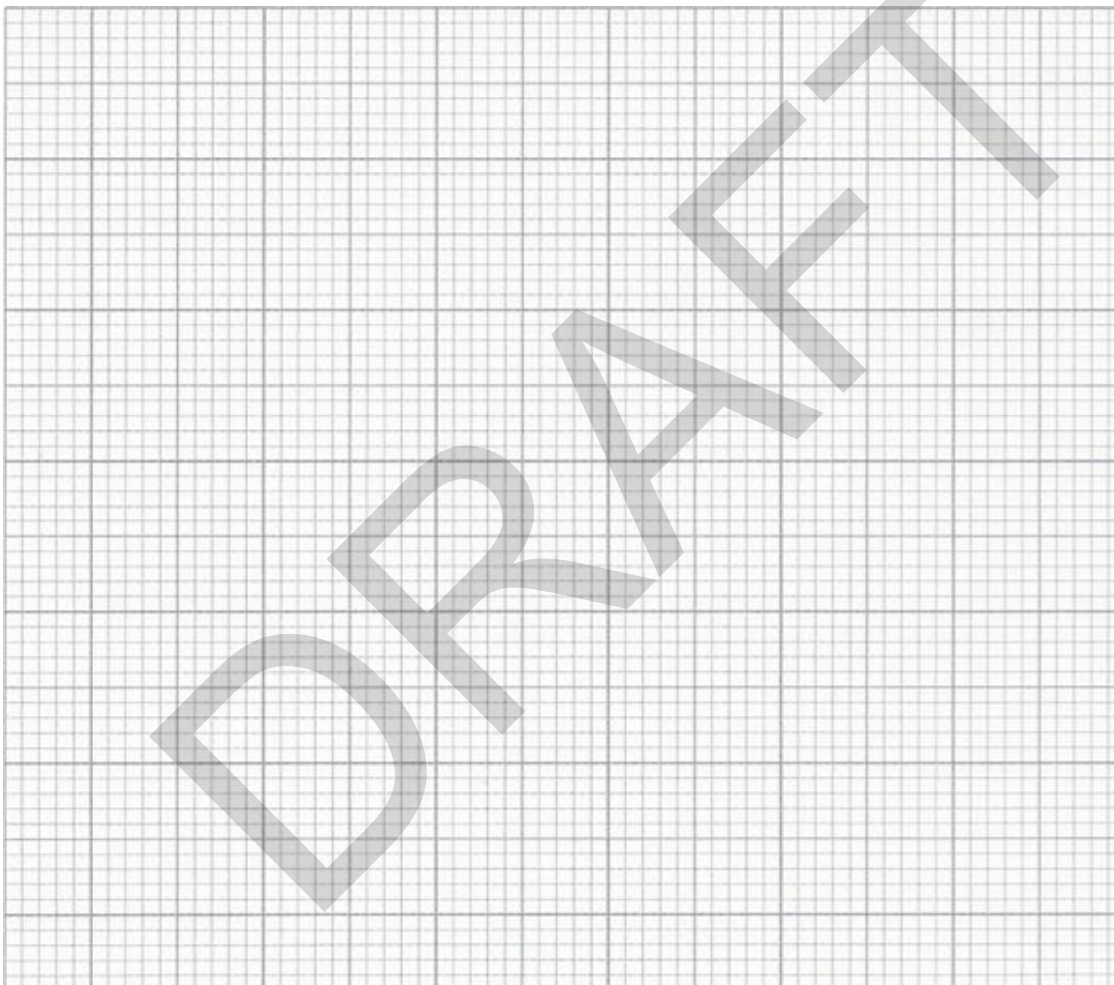
**Q15.**

A café owner wants to know how many cold drinks she is likely to sell next week.

The table shows the number of cold drinks sold and the temperature each day the café was open for the last two weeks.

Day	M	T	W	Th	F	S	M	T	W	Th	F	S
Temperature (°C) at midday	17	18	17	19	20	20	19	19	22	23	20	20
Number of cold drinks sold	24	26	25	30	32	28	27	29	35	40	30	34

Draw a scatter graph to show the relationship between the temperature and the number of cold drinks sold.



The weather forecast for next week says it will be 21°C on Monday.

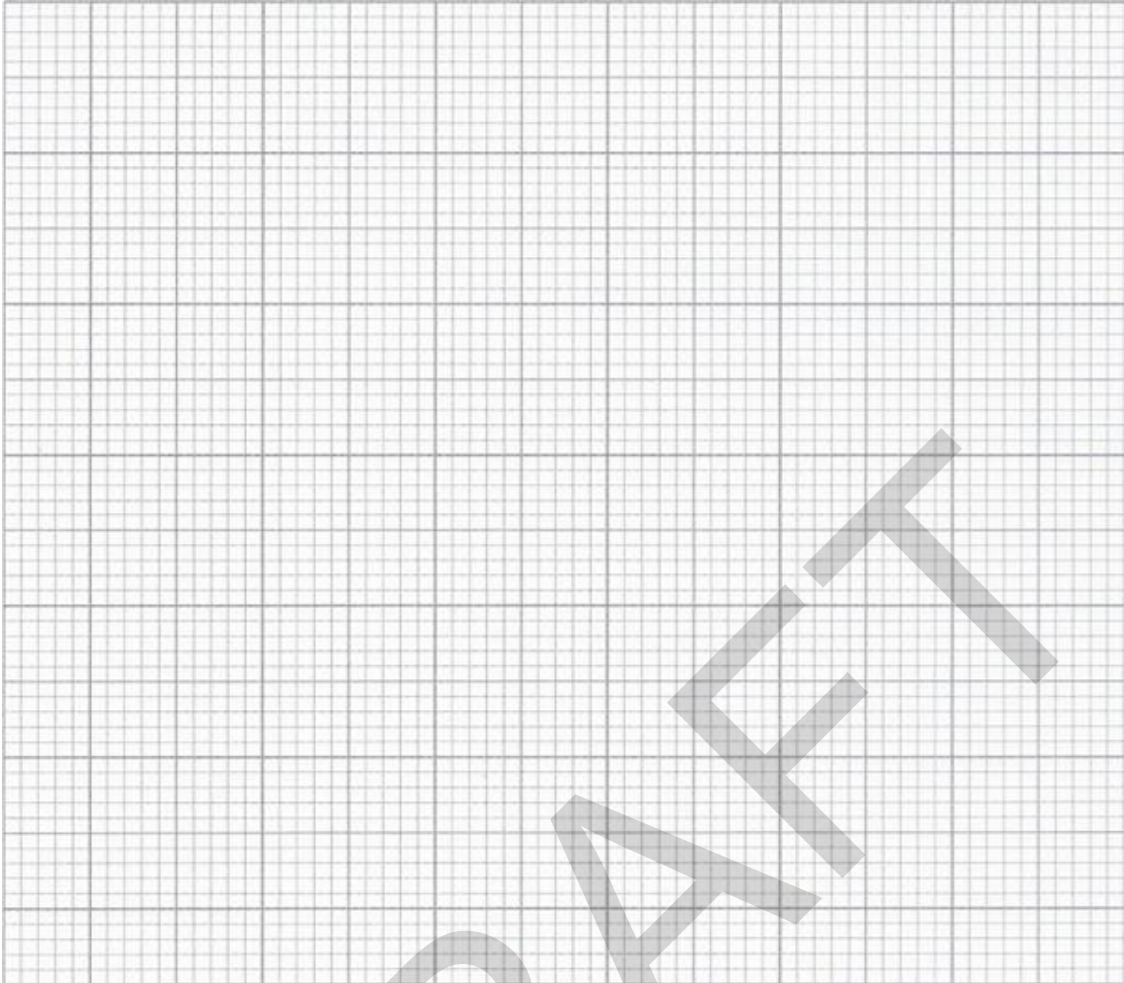
Use your scatter graph to find out how many cold drinks the café is likely to sell on Monday. Show clearly on your scatter graph how you found your answer.

**Expected sales on Monday \_\_\_\_\_ cold drinks sold**

**(6 marks)**

**End of Section 2**

**Spare graph paper for Question 15**



Extra space for working out and answers

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# Level 2 Functional Skills Mathematics

## Sample paper 1



Provisional mark scheme.

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# Guidance notes for Sample Paper Mark Schemes

## Level 1 and Level 2

### Notes for marking fixed response items:

Unless a whole number is specifically asked for, the markscheme gives credit for whole number answers with .0 or .00 on the end. Even though this is not a desirable level of accuracy, or indeed an expected answer, it is important that with only one mark available a candidate is not penalised for something that is not actually being tested. It is particularly important as, in the unlikely event of a candidate doing this, s/he would probably do it multiple times and lose a disproportionate number of marks.

### Notes for marking open response Problem Solving questions in Section 2:

The mark scheme has been carefully constructed to avoid penalising candidates repeatedly for similar errors.

1) The principle of follow through applies throughout unless otherwise stated. This allows the candidates to gain credit for subsequent correct calculation based on a previous incorrect answer. There is no follow-through between questions, but may be in multi-stage calculations within a question.

2) Units or numbers shown in brackets on the mark scheme are not required for the awarding of mark/s on the candidate's paper. However, if a candidate states units they must be correct:

eg 24(cm) means accept 24cm or 24 but not 24m

eg (£)72.5(0) means accept £72.50 or £72.5 or 72.50 or 72.5

3) Correct money format is expected in final answers unless otherwise indicated eg by brackets ie pounds must have two decimal places or no decimal places unless otherwise stated.

eg (£)5.00 or (£)5 not (£)5.0

eg (£)72.50 not (£)72.5

eg (£)37.43 not (£)37.432

4) URT means unrounded, rounded or truncated; the underlining defines the acceptable limit of approximation:

eg 860. 8652 URT (U is the unrounded version)

the following are acceptable: 860 (T) or 861 (R) 860.8 (T) or 860.9 (R) or 860.86 (T) or 860.87 (R) or 860.865 (R) or 860.8652 (U) but not eg 900.

The 3<sup>rd</sup> and 4<sup>th</sup> columns of the mark schemes show the marks to be given for specific responses. Marks in bold are for fully correct answers. Where full marks are not achieved, examiners will award the marks that correspond to the responses given in the grey rows below. Any unforeseen but creditable responses are noted during the early stage of marking and are considered and, where appropriate, added to the mark scheme by the Chief Examiner when the mark scheme is finalised.

Where the marks are awarded for a *complete correct method with one calculation error*, examiners give the mark for a substantially correct solution with a single accuracy error or single (or consistent) early rounding, but not with a method error.

**Maths Level 2 Sample paper 1: Section 1 – Non-calculator**

*For paper-based, examiners should accept correct answers given as words, including misspelt variants. Candidates must not lose marks for incorrect spelling.*

<b>Question</b>	<b>Total marks</b>	<b>Marks</b>	<b>Marks awarded for</b>
<b>1</b>	<b>1</b>	<b>1</b>	<b>66.67</b>
<b>2</b>	<b>1</b>	<b>1</b>	<b>28 or 28.0 or 28.00</b>
<b>3</b>	<b>1</b>	<b>1</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>1</b>	$\frac{3}{5}$ ie 3 in top box AND 5 in bottom box
<b>5</b>	<b>1</b>	<b>1</b>	$\frac{3}{14}$ ie 3 in top box AND 14 in bottom box
<b>6</b>	<b>1</b>	<b>1</b>	<b>400 or 400.0 or 400.00</b>
<b>7</b>	<b>1</b>	<b>1</b>	<b>90 or 90.0 or 90.00</b>
<b>8</b>	<b>1</b>	<b>1</b>	<b>70 or 70.0 or 70.00</b>
<b>9</b>	<b>1</b>	<b>1</b>	<b>905 or 905.0 or 905.00</b>
<b>10</b>	<b>1</b>	<b>1</b>	<b>51.768</b>
<b>11</b>	<b>1</b>	<b>1</b>	<b>15 or 15.0 or 15.00</b>
<b>12</b>	<b>1</b>	<b>1</b>	$\frac{1}{16}$ ie 1 in top box AND 16 in bottom box
<b>13</b>	<b>1</b>	<b>1</b>	<b>B</b>
<b>14</b>	<b>1</b>	<b>1</b>	<b>22 or 22.0 or 22.00</b> <b>accept 22000 or 22,000 or 22 000</b>
<b>15</b>	<b>1</b>	<b>1</b>	<b>1.55 only</b>
			<b>Total for Section 1 15 marks</b>

**Maths Level 2 Sample paper 1: Section 2 – Calculator**

*For paper-based, examiners should accept correct answers given as words, including misspelt variants. Candidates must not lose marks for incorrect spelling.*

Question	Total marks	Marks	Marks awarded for
1	1	1	B
2	1	1	B
3	1	1	125 or 125.0 or 125.00
4	1	1	D
5	1	1	C
6	1	1	man is right with valid comment referring to relationship between dollar and pound eg 'Because the pound is worth more than the dollar.'
7	3	3	(£)625 000
		2	÷1.12 or ÷112 x 100 seen
		1	1.12 seen
8	4	4	(£)930 or 930.00
		3	complete correct method with one calculation error or (£)4650 for taxable amount or (£)3000 AND (£)2370 from applying 0.2 to y and p
		2	correct substitution of given information into formula (y & p)
		1	(£)16500 for earnings for a year or order of operations correct
9	4	4	26 (cm <sup>2</sup> )
		3	6 (cm <sup>2</sup> ) for area of triangle or complete correct method with one calculation error
		2	correct method to find area of a triangle seen or 4(cm) seen for base of triangle and 20(cm <sup>2</sup> ) seen for area of rectangle
		1	4(cm) seen for base of triangle or 20(cm <sup>2</sup> ) seen for area of rectangle
10	4	4	11 (photos)
		3	10.9 (photos) for unrounded answer or complete correct method with one calculation error, with answer given rounded to nearest whole photo
		2	545 for $\Sigma fx$
		1	at least three of 4.5, 14.5, 24.5, 34.5, 44.5, 54.5 for midpoints
			NOTE: Estimating median and mode of grouped data are above the level, but in the event of a candidate working out the estimated median full marks are available 7 or 8 photos (with some working) = 4 marks 7.5 photos = 3 marks a complete correct method with one error = 2 marks median class 0-9 = 1 mark  In the event of a candidate giving the modal class as 0-9 = 1 mark
11	4	3	(£)506.25
		2	complete correct method with one calculation error or (£)405 for Monday to Friday or (£)101.25 For Saturday
		1	(£)13.50 for Saturday rate

			or 37.5 hours for Mon-Friday seen
		1	<b>a suitable check of their calculations using reasonable approximated values</b> eg $(5 \times 7 \times 10 = 350) + (1.25 \times 10 \times 8 = 100) = 450$
12	4	3	<b>(£)8.894117647 URT for cost of travelling extra distance per week</b>
		2	7.058823529 URT for litres per week or 14.82352941 URT for pence per mile or 4.44705882 URT for travelling extra distance based on journey one way only or a complete correct method with one error or early rounding
		1	60 for miles per week (Note this may be split if they do it per journey and then double at the end or if they do one day and then x5 at the end)
		1	<b>comparison of their calculated increased travel cost with increased pay (£8.50)</b> <b>AND decision with explanation just comparing the two values or reference to things like increased servicing costs/wear and tear etc</b>
13	5	5	<b>monthly tickets recommended</b> <b>AND explanation referring to cost AND time of travel/off-peak restrictions</b> <b>AND (£)682.20 for total for monthly tickets AND (£)832 for day returns</b> <b>AND (£)769.60 for weekly tickets</b>
		4	monthly tickets recommended or ticket consistent with their results <b>and</b> explanation referring to cost <b>or</b> time of travel/off-peak restrictions <b>and</b> (£)682.20 for total for monthly tickets <b>and</b> (£)832 for day returns <b>and</b> (£)769.60 for weekly ticket <b>or</b> complete correct method with one calculation or rounding error <b>and</b> corresponding decision <b>and</b> explanation
		3	monthly tickets recommended or ticket consistent with their results <b>and</b> explanation referring to cost <b>or</b> time of travel/off-peak restrictions <b>and</b> two of total costs from (£)682.20 for monthly tickets; (£)832 for day returns; (£)769.60 for weekly tickets <b>or</b> all three total costs correct, but incorrect/no recommendation
		2	monthly tickets recommended or ticket consistent with their results <b>and</b> explanation referring to cost <b>or</b> time of travel/off-peak restrictions <b>and</b> one of total costs from (£)682.20 for monthly tickets; (£)832 for day returns; (£)769.60 for weekly tickets <b>or</b> two total costs correct, but incorrect/no recommendation
		1	any one total cost correct from day return (£)832 off-peak day return (£)644.80 weekly (£)769.60 monthly (£)682.20
14	5	5	<b>Yes or equivalent</b> <b>AND explanation referring to average days before AND after changes</b> <b>AND supporting figures or calculations eg 9 days and 7 days (for mean)</b> <b>or 10 days and 8 days (for median)</b>
		4	one mean or one median correct <b>and</b> consistent decision and explanation <b>or</b> two means or two medians correct with incorrect/no explanation or decision
		3	one mean or one median correct
		2	correct method for one mean or median
		1	180 <b>and</b> 105 for total days off in each year <b>or</b> correct ordering of both sets of data

15	6	1	suitable axes and scale to plot all the data
		1	suitable title and labels eg <i>temperature °C</i> and <i>Number of drinks sold</i> . Accept either orientation. Note: consider labelling as a whole, eg title may be used to clarify vertical axis label
		2	12 plots correct $\pm 1$ small square (onscreen) / $\pm \frac{1}{2}$ small square (paper)
		1	6 plots correct $\pm 1$ small square (onscreen) / $\pm \frac{1}{2}$ small square (paper)
		1	value for Monday clearly marked on their graph eg by line of best fit (accept any straight line through the points with roughly equal number of plots either side)
		1	correct interpolated value from their graph eg 33 drinks
			<b>Total for Section 2    45 marks</b>

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Example graph for Section 2 Question 15

