**Pearson Edexcel
Functional Skills**

Past Paper 1

Time: 1 hour 30 minutes

Paper Reference **PMAT2/C01**

Mathematics

**Level 2
Section B (Calculator)**

You must have:
Pen, calculator, HB pencil, eraser, ruler graduated in cm and mm, protractor, pair of compasses. Tracing paper may be used.

Total Marks

My signature confirms that I will not discuss the content of the test with anyone.

Signature: _____

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Sign the declaration.
- Answer **all** questions.
- Write your final answers in the boxes provided.
- Answer the questions in the spaces provided – *there may be more space than you need*.
- You **must** show clearly how you get your answers in the spaces provided. Marks will be awarded for your working out.
- Check your working and your answers at each stage.
- Diagrams are **not** accurately drawn, unless otherwise indicated.
- **Calculators may be used.**
- If your calculator does not have π button take the value of π to be 3.14

Information

- The total mark for this section is 48.
- The total mark for this paper is 64.
- The marks for each question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- This sign ☑ shows where marks will be awarded for showing your checks.

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ▶

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Worked Solutions

Pearson

Please note that these worked solutions have neither been provided nor approved by Pearson Education and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue indicates what must be written in order to answer the questions and get the marks. The worked solutions have been designed to show the smallest amount of work which needs to be done to answer the question.

Anything written in green in a cloud doesn't have to be written in the exam.

Anything written in orange in a rectangle doesn't have to be written in the exam and is there to show what should be put into a calculator or measured using a ruler or protractor.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

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SECTION B

Answer ALL questions. Write your answers in the spaces provided.

1 Adam works for an agency.
His normal hourly rate is £8.32

The agency asks Adam to work 6 hours for a new company.
Adam will be paid time and a third of his normal hourly rate.

How much will Adam get paid in total when working for the new company?

(3)

$$\left(1 + \frac{1}{3}\right) \times 8.32 \times 6$$

1 + 1/3 works out the fraction of his normal hourly rate he is paid. Multiplying this by his normal hourly rate works out his wage at the new company. Multiplying this by the 6 hours works out the total he is paid when working for the new company

£   66.56

(Total for Question 1 is 3 marks)

2

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2   Here is a square based pyramid.
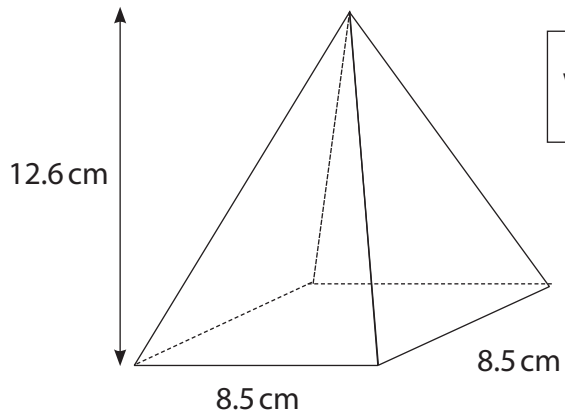
$$\text{Volume of pyramid} = \frac{1}{3} \times \text{area of base} \times \text{height}$$

12.6 cm

8.5 cm

8.5 cm

Work out the volume of this pyramid.

(3)

$$\frac{1}{3} \times \underline{8.5 \times 8.5} \times \underline{12.6}$$

Area of base. The base is a square so its area can be worked out by multiplying together the length and width

Height

303.45   cm³

(Total for Question 2 is 3 marks)

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3 Rana donated to 4 charities last year.
She gave £175 to each of these charities.

This year Rana wants to donate the same total amount between 6 charities.
Each charity will receive an equal amount.

(a) How much will each charity receive this year?

(3)

$$\frac{175 \times 4}{6}$$

> Multiplying the £175 by the 4 charities works out how much the total amount donated last year was. Dividing this by the 6 charities works out how much each will get this year
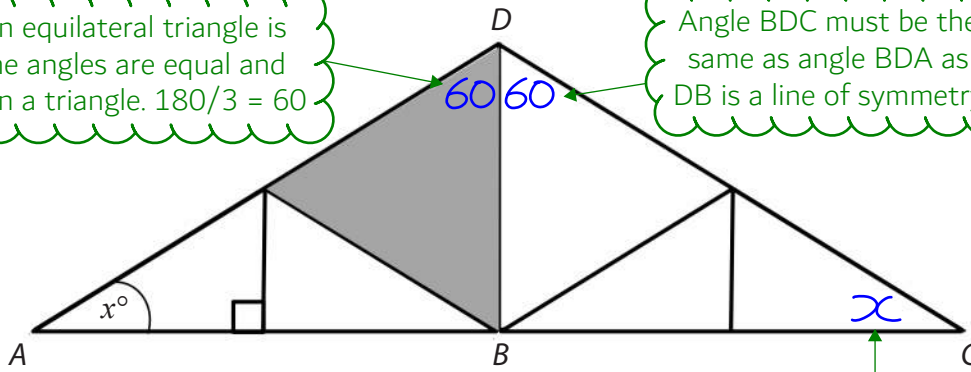
> The 116.66666... is rounded to the nearest penny

£ | 116.67

(b) Use reverse calculations to check your answer.

(1)

$$\frac{116.\dot{6} \times 6}{4} = 175$$

(Total for Question 3 is 4 marks)

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4 Samir is a roofer.
Here is a section of a roof made from straight pieces of wood.

60 60

$x°$

x

A   B   C

D

Pitch	Angle (°)
12	45
11	42.5
10	40
9	37
8	33.75
7	30
6	26.5
5	22.5
4	18.5
3	14
2	9.5
1	4.5
0	0

Samir knows that

- the shaded triangle is an equilateral triangle
- the line *DB* is a line of symmetry
- the line *ABC* is a straight line
- the size of the angle marked $x°$ indicates the pitch of the roof.

The table shows information about the pitch and angle of a roof.

Find the value of x and use the table to give the pitch of the roof.

(3)

$$\frac{180 - 60 - 60}{2}$$

$x =$ 30

pitch = 7

(Total for Question 4 is 3 marks)

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Turn over ▶

5 Samir wants to work out the cost of the tiles needed to replace a roof.
The roof has 4 identical faces.
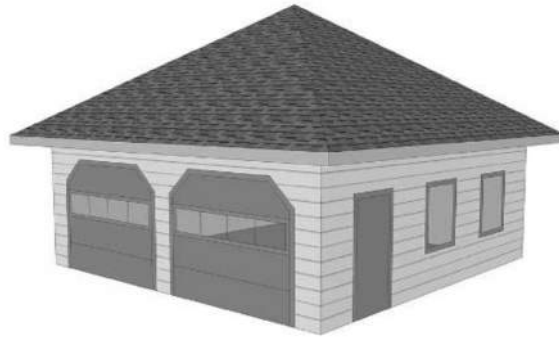
Each face is a triangle.
Each triangle has a base length of 7.6 m and a height of 4.8 m.

Samir has this information.

---

roof tiles

1 pack of tiles covers 13.8 m² (including overlaps)
each pack costs £716.10

Samir can only buy whole packs of these tiles.

Calculate the total cost of the tiles for the 4 faces of this roof.

(5)

$$\frac{4 \times \frac{1}{2} \times 7.6 \times 4.8}{13.8}$$

Area of triangle = 1/2 x base x height. The base of each triangle is 7.6m and the height is 4.8m. Multiplying the area of one of the triangles by 4 works out the area of the whole roof. Dividing this by the 13.8m² works out how many packs of tiles are needed

6×716.10

The 5.2... packs is rounded up to 6 as there need to be a whole number of packs and 5 wouldn't be enough. Multiplying this by the cost of each pack works out the total cost of the tiles

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0.6 of a pound means 60p

£ | 4296.60

(Total for Question 5 is 5 marks)

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6 Farah is buying clothes from a website.
The website shows this information about a jacket Farah wants to buy.

> **Jacket**
>
> original price £30.99
> sale price £16

The website claims this is a saving of 46%.

Is the sale price a saving of 46% on the original price?
Show why you think this.

(3)

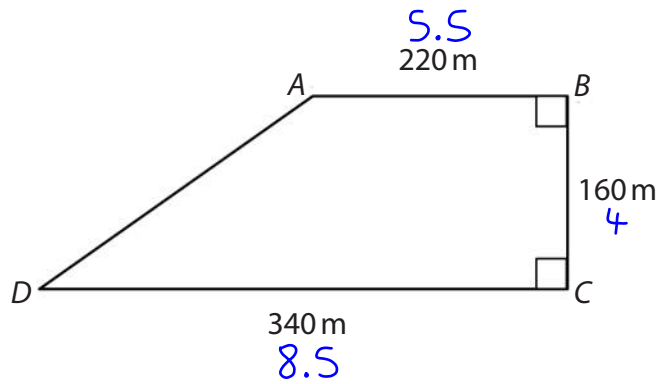$$30.99 \times \frac{100-46}{100} = 16.73$$

Percentage is out of 100 so subtracting 46% from 100% works out the percentage it reduces to. Dividing this by 100 converts it into a fraction which when the £30.99 is multiplied by it reduced it by 46%

When reduced by 46% the price is £16.73. This is not £16
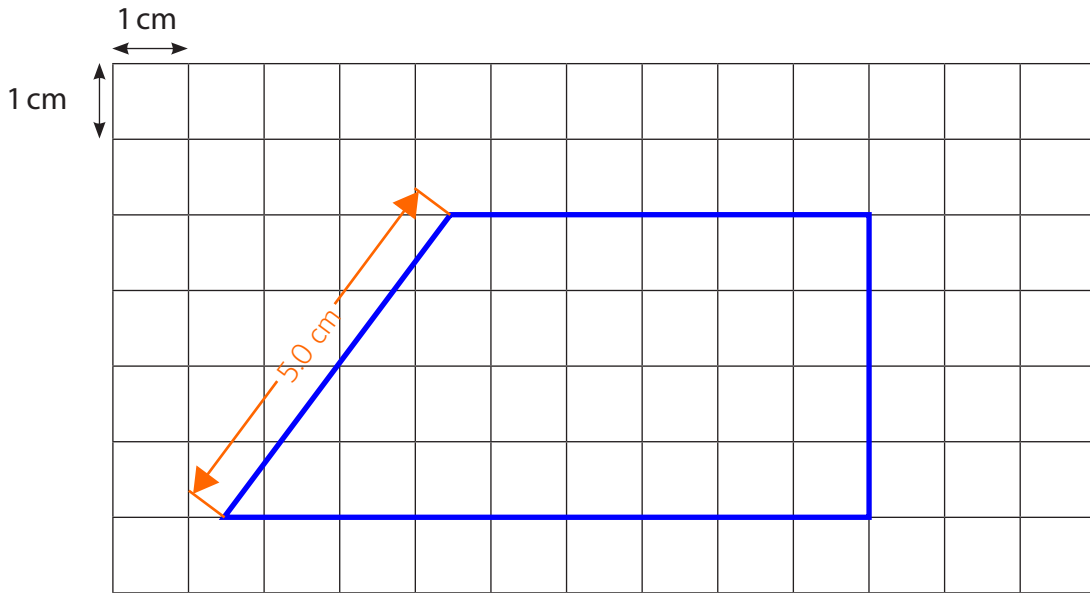
No

(Total for Question 6 is 3 marks)

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7 Here is a quadrilateral.

5.5
220 m

A ———— B

160 m
4

D ———— C
340 m
8.5

(a) Draw this shape on the grid.
Use the scale 1 cm to 40 m.

(2)

1 cm

1 cm

5.0 cm

(b) Use your answer to part (a) to work out the actual length of the line *AD*.
Remember to use the grid and the scale.

(2)

5 × 40

200 m

(Total for Question 7 is 4 marks)

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Turn over ▶

8 Pablo is investigating the relationship between the land area and the population of 8 European countries.

He has this information.

Country	Land area (1000 km²)	Population in 2018 (millions)
Germany	360	83
Greece	130	11
Italy	300	58
Poland	310	39
Spain	510	47
France	640	67
Romania	240	19
United Kingdom	*240*	*67*

Pablo finds out that the United Kingdom's
* land area is 93 400 square miles
* population in 2011 was 56.1 million
* population increased by 19.6% between 2011 and 2018

He wants to add this information to the table above.
He will round the land area to the nearest 10 000 and round the population to the nearest million.

Pablo knows
1 square mile = 2.6 km²

Draw a suitable graph and write a comment about the correlation.
Remember to complete the table and use the grid to draw your graph.

(6)

$$93400 \times 2.6$$

Each square mile is 2.6km² so multiplying the 93400 by 2.6 converts it into km². 242840 is 240000 to the nearest 10000

$$56.1 \times \frac{100+19.6}{100}$$

100 + 19.6 works out the percentage of the population in 2011 the population in 2018 increases to. Dividing this by 100 converts it into a fraction which when multiplied by it increases the population in 2011 by 19.6%. 67.0... million rounds to 67 million to the nearest million
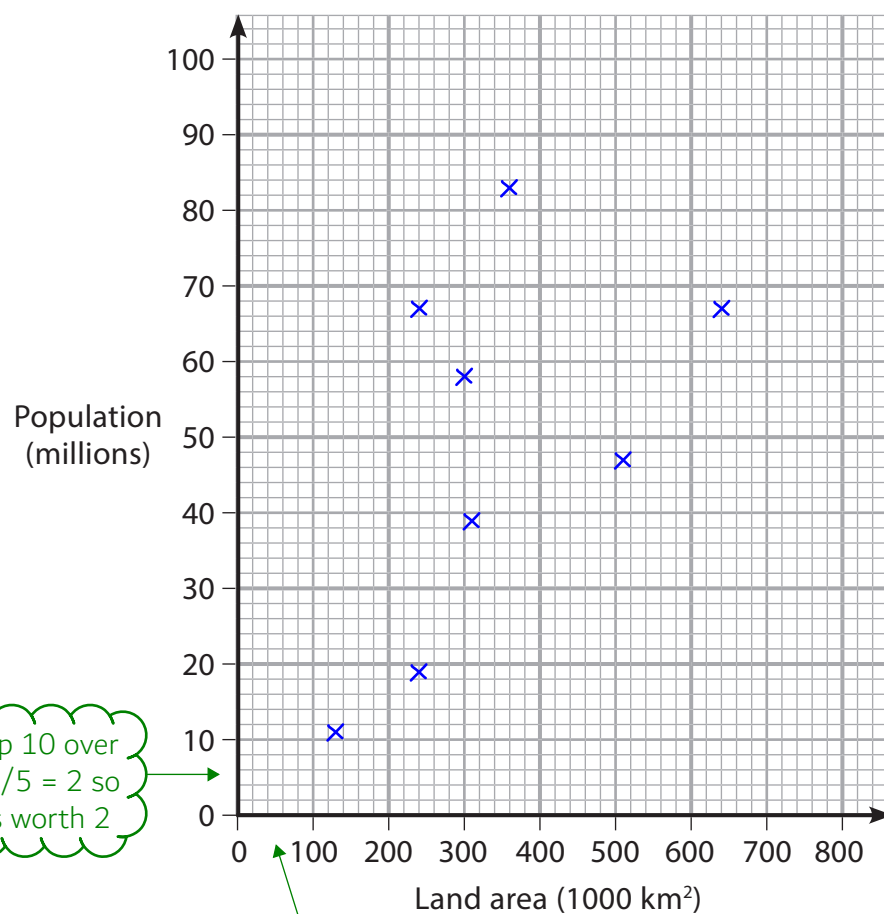
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100
90
80
70
60
Population
(millions) 50
40
30
20
10
0

0 100 200 300 400 500 600 700 800
Land area (1000 km²)

This scale goes up 10 over 5 small boxes. 10/5 = 2 so each small box is worth 2

This scale goes up 100 over 5 small boxes. 100/5 = 20 so each small box is worth 20

Positive correlation

Generally as the land area increases so does the population. As both variables are increasing this is positive correlation

(Total for Question 8 is 6 marks)

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9 Magda wants to compare the population density of the two largest countries in the world.

She can use this formula.

$$K = \frac{P}{2.59\,M}$$

K = population density (people per km²)

P = population (millions)

M = land area (million square miles)

Canada has a population density of 3.57 people per km²

Russia has
- a population of 143.96 million
- a land area of 6.593 million square miles.

Magda thinks that Russia has a greater population density than Canada.

Is Magda correct?
Show why you think this.

(3)

$$\frac{143.96}{2.59 \times 6.593} = 8.4$$

P is 143.96 and M is 6.593. The millions can be ignored as there is a million as the numerator and denominator and these cancel out. Substituting these values into the right side of the formula gives the population density

The population density of Russia is 8.4 people per km², which is more than the 3.7 people per km² of Canada

Yes

(Total for Question 9 is 3 marks)

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10

(a) Work out $3\frac{3}{8} - \frac{9}{8}$

Give your answer as a mixed number.

(2)

Type into the calculator

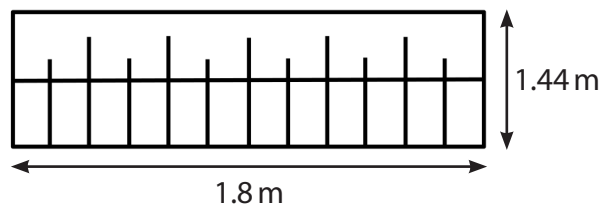$2\frac{1}{4}$

(b) Use estimation to show a check of your answer.

(1)

$3 - 1 = 2$

Both numbers are rounded to the nearest whole number. 2 is close to the answer to part (a)

(Total for Question 10 is 3 marks)

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Turn over ▶

11 Emilio makes metal fences.
He is making a fence using this design.

The fence will need
- 3 horizontal metal pieces of length 1.8 m
- 2 tall metal pieces of length 1.44 m
- 5 medium metal pieces
- 6 short metal pieces as shown on the diagram.

The heights of the tall, medium and short metal pieces are in the ratio 9:8:7

How many metres of metal in total does Emilio need to make the fence?

(5)

$$1.8 \times 3 + 1.44 \times 2 + \frac{1.44}{9} \times 8 \times 5 + \frac{1.44}{9} \times 7 \times 6$$

The total length of the 2 tall metal pieces of length 1.44 m

The total length of the 6 short metal pieces. Dividing the length of the tall metal pieces by 9 works out what 1 part of the ratio is worth. Multiplying this by 7 works out what 7 parts are worth, which represents the length of the short metal pieces

The total length of the 3 horizontal metal pieces of length 1.8m

The total length of the 5 medium metal pieces. Dividing the length of the tall metal pieces by 9 works out what 1 part of the ratio is worth. Multiplying this by 8 works out what 8 parts are worth, which represents the length of the medium metal pieces

Adding together the total lengths of all the different types of metal pieces works out the total length of metal needed

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21.4   m

(Total for Question 11 is 5 marks)

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12 The table shows some information about 60 holidays bought by customers at a travel agency.

		Room only	Bed and breakfast	All-inclusive	Total
		Holiday type			
Customer type	**Couples**	3	13	18	34
	Families	2	10	14	26
	Total	5	23	32	60

(a) Complete the table above.

(2)

> The total column adds up to 60. 60 - 34 = 26 so this must be the total for the families. The couples row adds up to 34. 34 - 3 - 18 = 13 so this must be the number of couples with bed and breakfast. The total of the all-inclusive is 18 + 14 = 32. The families row adds up to 26 and 26 - 10 - 14 = 2. The room only total is 3 + 2 = 5

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A customer who bought a holiday at the travel agency is chosen at random.

(b) What is the probability that this customer bought an all-inclusive holiday for a couple?
Give your answer as a fraction in its simplest form.

(2)

$$\frac{18}{60}$$

18 out of the 60 total customers who bought a holiday were an all-inclusive holiday for a couple

Typing 18/60 into the calculator then pressing = gives the fraction in its simplest form

$$\frac{3}{10}$$

The travel agent says

'Of the couples and families who bought holidays the couples were more likely to have bought an all-inclusive holiday.'

(c) Is the travel agent correct?
Show why you think this.

(2)

$$\frac{18}{34} - \frac{14}{26} = -\frac{2}{221}$$

18 out of the 34 couples bought an all-inclusive holiday so the probability is 18/34 for a couple to have bought an all-inclusive holiday. 14 out of the 26 families bought an all-inclusive holiday so the probability is 14/34 for a family to have bought an all-inclusive holiday. Subtracting the two probabilities gives a negative number so the second probability must be greater. Therefore the families were more likely to have bought an all-inclusive holiday

No

(Total for Question 12 is 6 marks)

TOTAL FOR SECTION B IS 48 MARKS
TOTAL FOR PAPER IS 64 MARKS

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