



Please write clearly in block capitals.

Centre number

Candidate number

Surname

Forename(s)

Candidate signature

I declare this is my own work.

Functional Skills Level 2

MATHEMATICS

Paper 2 Calculator

Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- a calculator
- mathematical instruments.



Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.
- State the units of your answer where appropriate.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.
- If your calculator does not have a π button, take the value of π to be 3.142

Advice

In all calculations, show clearly how you work out your answer.

For Examiner's Use

Question	Mark
1–6	
7	
8	
9	
10	
TOTAL	



N 0 V 2 1 8 3 6 2 2 0 1

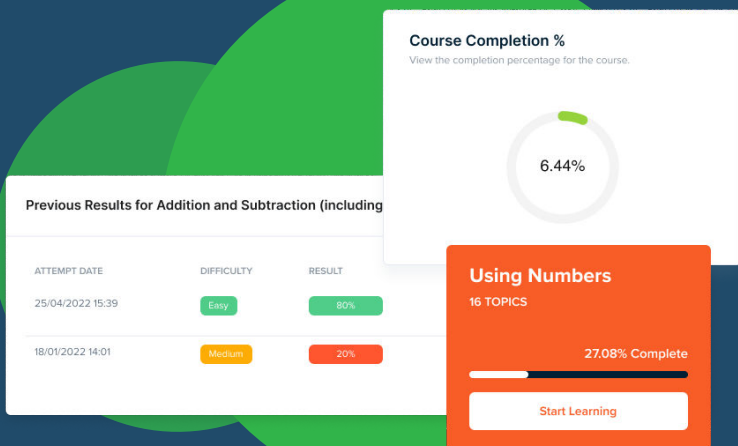
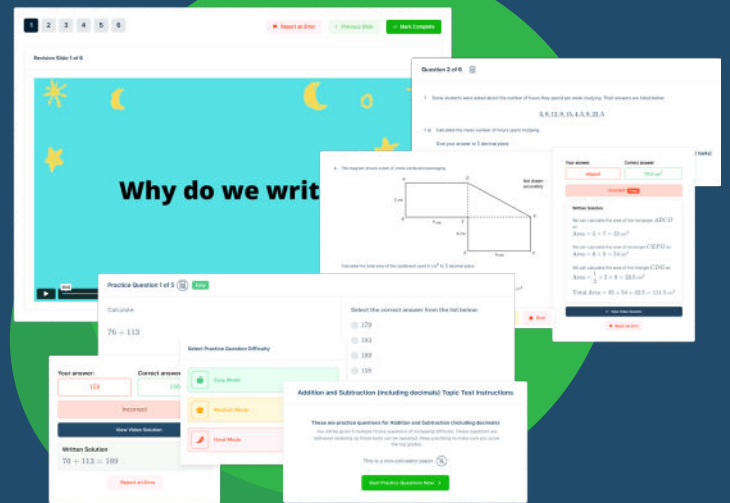


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Section A

Do not write
outside the
boxAnswer **all** questions in the spaces provided.

- 1 The probability of an event happening is $\frac{3}{5}$

Circle the probability of the event **not** happening.

[1 mark]

1

 $\frac{2}{5}$ $\frac{3}{5}$

0

- 2 $x = 5$ and $y = -3.2$

Work out the value of $x + y^2$

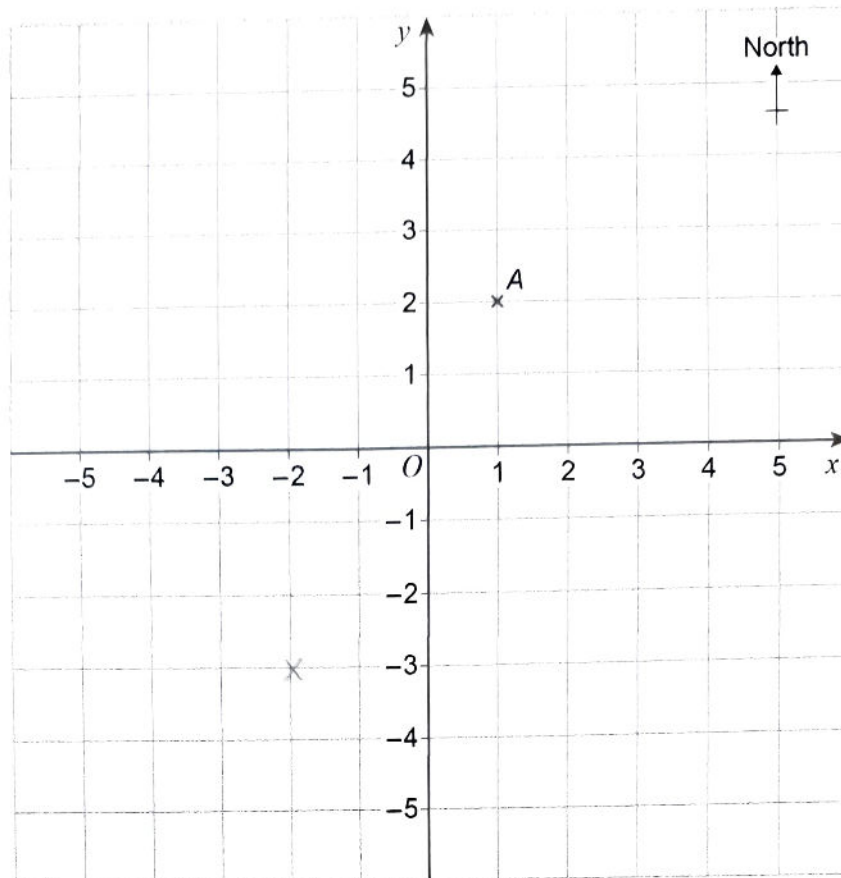
[2 marks]

$$5 + (-3.2)^2 = 15.24$$

Answer 15.24

Do not write
outside the
box

3



A is the point (1, 2)

B is the point

3 squares West of A

and

5 squares South of A.

Work out the coordinates of B.

[2 marks]

Answer (-2 , -3)

Turn over ►



Do not write
outside the
box

4 In the boxes, write the number that is

3 more than -8 4 less than -2 halfway between -7 and 5

[3 marks]

5 Write the ratio $144 : 90$ in its simplest form.

[2 marks]

 $144 : 90$ $16 : 10$ $8 : 5$ Answer $8 : 5$ 

- 6 Here is an isosceles triangle.

Do not write
outside the
box



Not drawn
accurately

Work out the size of angle x .

[2 marks]

$$180 - 2(42) = 96$$

Answer 96 °

12

Turn over for Section B

Turn over ►



Section B

Do not write
outside the
boxAnswer **all** questions in the spaces provided.7 **Energy**

Jim's house has gas central heating.

- 7 (a) The charges for the gas Jim uses are shown in the table.

Cost per unit of gas (kWh)	2.92 p
Standing charge per day	39.6 p

In November, Jim uses 1976 kWh of gas.

Use **approximations** to estimate Jim's November gas payment.

Give your answer in pounds.

[5 marks]

$$1976 \times 2.92 =$$

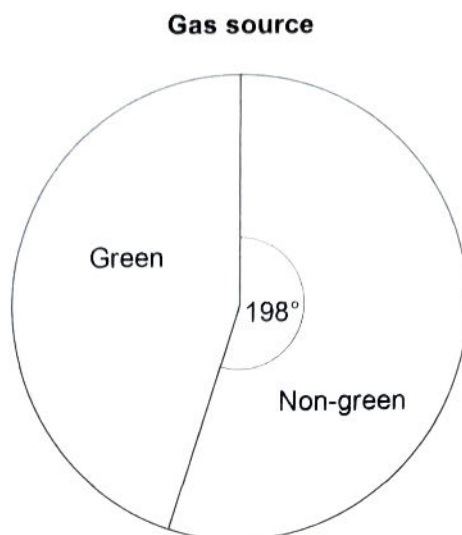
$$\text{approximately} \rightarrow 2000 \times 3 = 6000$$

$$\text{per day approx } 40 \times 30 \text{ days} \\ = 1200$$

$$\text{Total} = 6000 + 1200 \\ = 7200 \text{ p} \\ = \text{£} 72$$

Answer £ 72

- 7 (b) Jim's current gas company produces 43% of their gas from green sources. He sees this pie chart for another gas company, MixGas.



Jim wants to use the company with a greater proportion of gas from green sources.

Should Jim change to MixGas?

You **must** show your working.

[3 marks]

$$360^\circ - 198^\circ = 162^\circ$$

$$\frac{\text{proportion}}{\text{total circle}} = \frac{162}{360} = 0.45 \times 100 = 45\%$$

$$45\% > 43\%$$

Yes Jim should change to MixGas

Question 7 continues on the next page

Turn over ►



Do not write
outside the
box

- 7 (c) Jim is thinking of buying solar panels.
The price of these panels has decreased by 27% since 2016
Jim would need to pay £4803.40 for the panels now.
How much would the panels have cost in 2016?

[3 marks]

$$100 - 27 = 73$$

$$4803.40 \div 73 \times 100 = 6580$$

Answer £ 6580

11



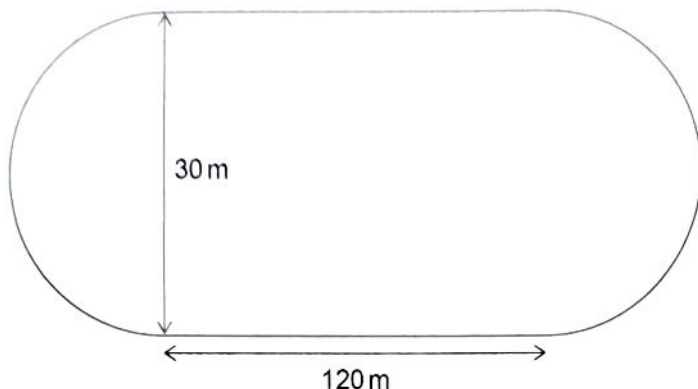
8 Dog

Ben has a dog called Pluto.

8 (a) Ben takes Pluto for a walk.

They walk **4 laps** of a sports track.

The sports track is the shape of two semi-circles joined by two straight sections.



Not drawn
accurately

Ben has a target to walk 5000 m each day.

What percentage of his daily target has Ben completed on this walk?

[5 marks]

$$\begin{aligned} \text{area of a hemisphere} &= \frac{1}{2} \pi d \\ &= \frac{1}{2} \pi (30) = 47.12 \end{aligned}$$

$$2 \text{ hemispheres so } 47.12 \times 2 = 94.25$$

$$\text{Total} = 94.25 + 120 + 120 = 334.2$$

$$4 \text{ laps} = 334.2 \times 4 = 1337$$

$$\% = 1337 \div 5000 \times 100$$

Answer 27 %

Question 8 continues on the next page

Turn over ►



- 8 (b) Pluto needs to eat 420 grams of food each day, in the ratio
wet food : dry food = 2 : 5

Ben buys a 12 kilogram bag of **dry** food.

How many days of **dry** food does the bag provide?

[4 marks]

$$420 \text{ grams } 2:5$$

$$420 \div 7 = 60 \text{ g}$$

$$\text{wet} = 60 \times 2 = 120 \text{ g}$$

$$\text{dry} = 60 \times 5 = 300 \text{ g}$$

$$12 \text{ kg} = 12000 \text{ g}$$

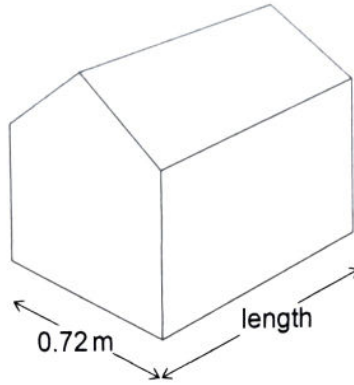
$$\frac{12000}{300} = 40 \text{ days}$$

Answer 40 days



Do not write
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box

- 8 (c) In his garden, Ben has a rectangular fenced area for Pluto.
The fenced area measures 2.4 m by 2.25 m
Ben builds a kennel for Pluto which covers $\frac{1}{6}$ of the fenced area.
Here is a sketch of the kennel.



The base of the kennel is a rectangle.

Work out the length of the kennel.

[4 marks]

$$\begin{array}{l} \text{fenced area:} \\ 2.4 \text{ m} \times 2.25 \text{ m} = 5.4 \text{ m}^2 \end{array}$$

$$\begin{array}{l} \text{kennel:} \\ \frac{1}{6} \text{ of } 5.4 \text{ m}^2 = 0.9 \text{ m}^2 \end{array}$$

$$0.9 \text{ m}^2 = 0.72 \text{ m} \times \text{length}$$

$$\text{length} = \frac{0.9}{0.72}$$

$$= 1.25 \text{ m}$$

Answer 1.25 m

13

Turn over for the next question

Turn over ►



Do not write
outside the
box**9 Fundraising**

A charity organises an annual sponsored swim.

9 (a) Ahmed swam 50 lengths of a pool that is 25 metres long.

The swim took him 38 minutes.

Ahmed says,

"My average speed was more than 0.7 metres per **second**."

Is Ahmed correct?

You **must** show your working.

[4 marks]

$$50 \text{ lengths} \times 25 \text{ m} = 1250 \text{ m}$$

$$38 \text{ mins} = 2280 \text{ seconds}$$

$$\text{speed in metres per second} = \frac{1250}{2280}$$

$$= 0.548 \text{ ms}^{-1}$$

No his speed was less than 0.7 ms^{-1}



Do not write
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box

- 9 (b) Ahmed collected £35 for his swim and gave it to the charity.

$\frac{6}{7}$ of this money was donated by taxpayers.

Using Gift Aid, the charity claimed an extra 25p for every £1 donated by a taxpayer.

How much money did the charity receive, **including** Gift Aid, from Ahmed's swim?

[3 marks]

$$35 \times \frac{6}{7} = 30$$

£30 by taxpayers

25p extra per £1

$$£30 \times 0.25 = 7.5$$

$$\text{total} = £35 + £7.5 = £42.50$$

Answer £ 42.50

Question 9 continues on the next page

Turn over ►



- 9 (c) This year, 20 people completed the sponsored swim.
The table shows information about the sponsor money collected.

Money (£x)	Frequency	Mid-point	frequency x midpoint
$0 < x \leq 10$	7	5	35
$10 < x \leq 20$	4	15	60
$20 < x \leq 30$	6	25	150
$30 < x \leq 40$	1	35	35
$40 < x \leq 50$	2	45	90
	Total = 20		370

Last year, the mean amount collected per swimmer was £14.85

The charity organiser says,

“This year’s mean amount is **more than** £3 higher than last year’s.”

Show your working to support this statement.

[5 marks]

$$7 \times 5 = 35$$

$$4 \times 15 = 60$$

$$6 \times 25 = 150$$

$$1 \times 35 = 35$$

$$2 \times 45 = 90$$

$$370$$

$$370 \div 20 = 18.5 \text{ mean}$$

difference between this year and last year:

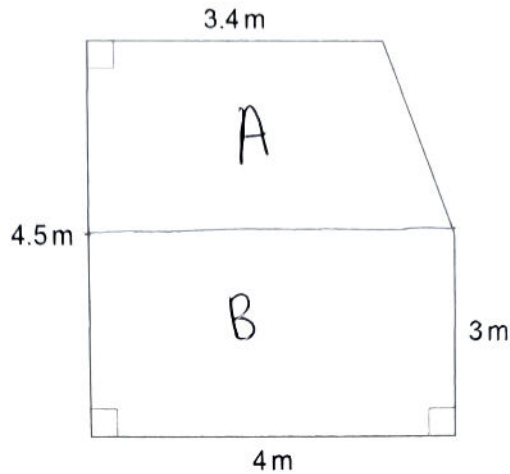
$$£18.5 - £14.85 = £3.65$$

∴ Yes, more than £3 higher



Do not write
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box**10 Conservatory**

Molly is building a conservatory.

10 (a) Here is a plan view of the conservatory.Not drawn
accurately

The conservatory floor will be made of concrete.

The concrete floor will be 0.1 m deep.

What volume of concrete will Molly need for the floor?

State the units of your answer.

[6 marks]

$$\text{Area} = \text{area A} + \text{area B}$$

$$A : \frac{1}{2} (3.4 + 4) \times (4.5 - 3)$$

$$\frac{1}{2} (7.4) \times 1.5 = 5.55$$

$$B : 3 \times 4 = 12$$

$$\text{Total area} = 12 + 5.55 = 17.55$$

$$\text{volume} = 17.55 \times 0.1 = 1.755 \text{ m}^3$$

$$\text{Answer } 1.755 \text{ m}^3$$

Question 10 continues on the next page**Turn over ►**

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- 10 (b) Molly has a scale drawing of the side elevation of the conservatory.
The scale of the drawing is 3 : 50
The height of the conservatory on the scale drawing is 23.4 centimetres.
Is the actual height of the conservatory **less than** 4 metres?
You **must** show your working.

[3 marks]

$$\begin{array}{l} \text{Scale height} = 23.4 \text{ cm} \\ 3 : 50 \end{array}$$

$$23.4 \div 3 = 7.8 \text{ cm}$$

$$7.8 \times 50 = 390 \text{ cm}$$

$$390 \text{ cm} = 3.9 \text{ m}$$

Yes the actual height is less than
4m (3.9m).



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- 10 (c)** Molly wants to build a brick wall as part of the conservatory.
It would take Molly 12 hours to build the wall by herself.
Molly pays 2 builders to work with her to build the wall.
Molly pays each builder £14.73 per hour.

How much will Molly pay each builder for their work?

Assume that Molly and the builders work at the same rate.

[3 marks]

$$12 \text{ hours} \div 3 = 4 \text{ hours with 3 builders (molly + 2)}$$

$$4 \times \pounds 14.73$$

$$= \pounds 58.92$$

Answer £ 58.92

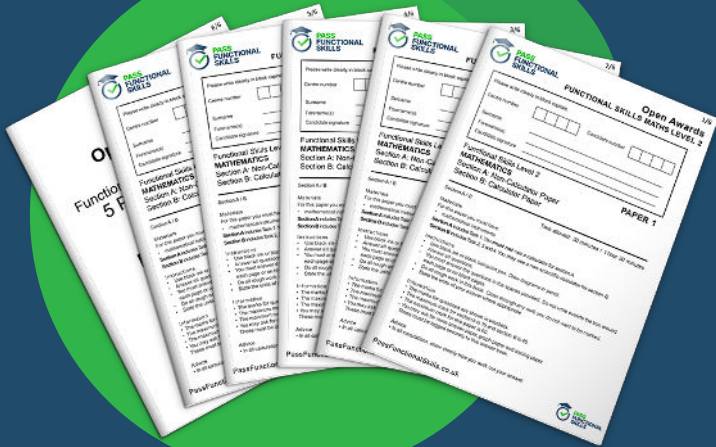
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END OF QUESTIONS

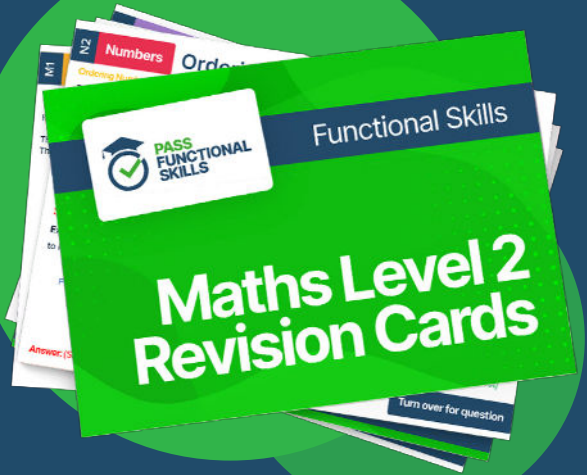




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