



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
1-7	
8	
9	
10	
11	
TOTAL	



M A R 2 2 8 3 6 2 2 0 1

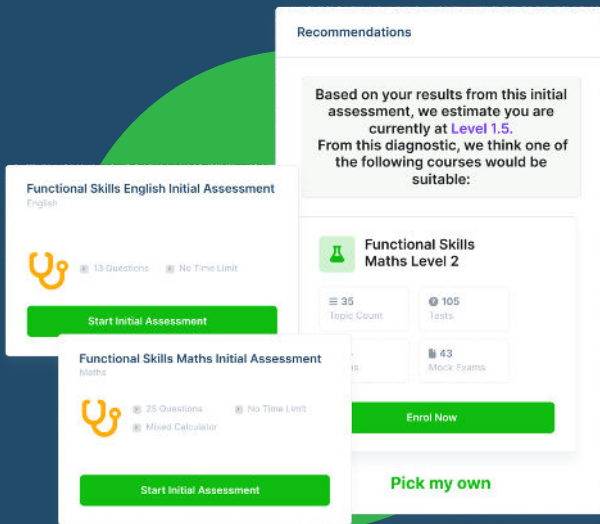
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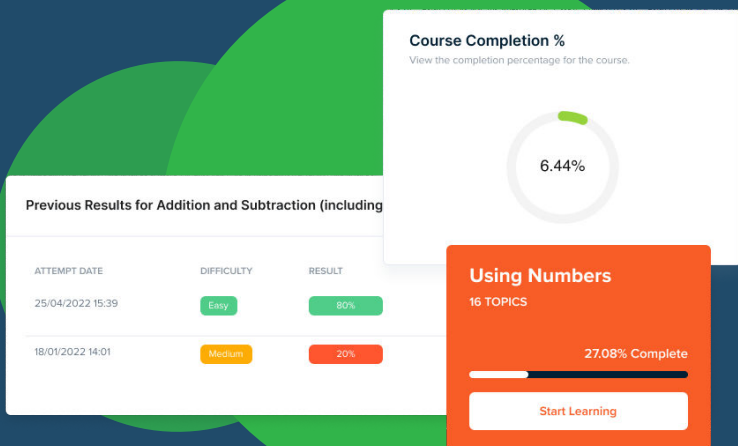
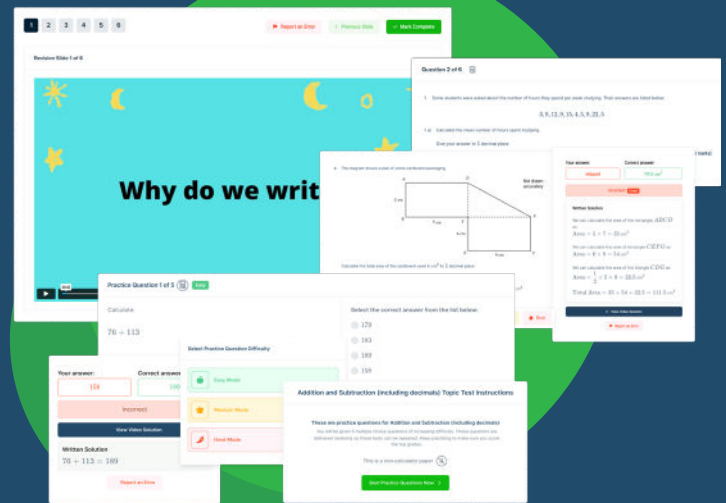


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Section A

Do not write
outside the
box

Answer all questions in the spaces provided.

- 1 Circle the **smallest** number.

[1 mark]

1

 -5

-3

0

- 2 Complete the table to show equivalent fractions, decimals and percentages.

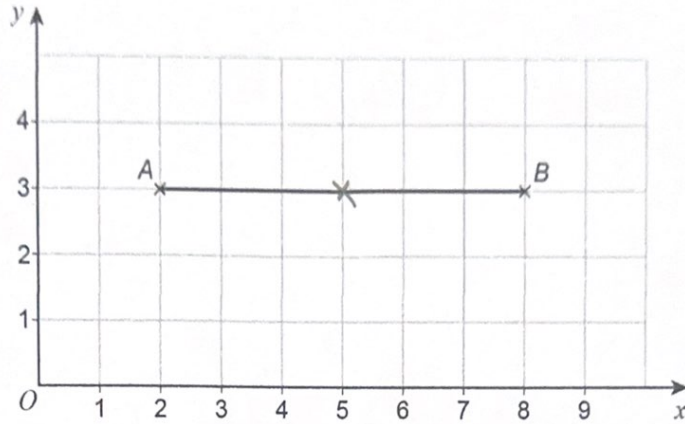
[3 marks]

Fraction	Decimal	Percentage
$\frac{17}{20}$	0.85	85%
$\frac{1}{25}$	0.04	4%
$\frac{59}{100}$	0.59	59%



3

A(2, 3) and B(8, 3) are points on a grid.

Do not write
outside the
boxWork out the coordinates of the **midpoint** of line AB.

[1 mark]

Answer (5 , 3)

4

Here are six numbers.

7 10 13 7 15 8

Work out the median.

[2 marks]

$$7, 7, 8, 10, 13, 15.$$

$$\frac{8+10}{2} = 9.$$

Answer 9

Turn over ►



5

Express 76 as a percentage of 200

[1 mark]

Do not write
outside the
box

$$\frac{76}{200} \times 100 = 38\%$$

Answer 38 %

6

Share 126 in the ratio 3 : 11

[2 marks]

$$3+11=14. \quad 126 \div 14 = 9.$$
$$3 \times 9 : 11 \times 9$$
$$= 27 : 99$$

Answer 27 and 99

- 7 Which is closer to 9.5
9.073 or 9.916?

You **must** show your working.

[2 marks]

$$9.5 - 9.073 = 0.427.$$

$$9.916 - 9.5 = 0.416. \leftarrow$$

9.916 is closer.

Answer 9.916.

12

Turn over for the next section

Turn over ►



Section B

Do not write
outside the
box

Answer all questions in the spaces provided.

8 Pets

- 8 (a) Miya manages a pet shop.
She reduces the price of all fish tanks by 17%
She puts this sticker on one of the tanks.

Reduced by 17%
Was £195
Now £167.95

Has Miya calculated the new price correctly?
You **must** show your working.

[3 marks]

$$195 \times (1 - 0.17) = 195 \times 0.83$$
$$= \underline{\pounds 161.85.}$$
$$\neq \pounds 167.95.$$

Miya is wrong.



- 8 (b) Alex makes food for his dogs.
He uses 2 **pounds** of mince to make 12 portions of food.
He has 1.5 **kilograms** of mince.
Is this enough to make 21 portions of food?
Use 1 kg = 2.2 pounds
You **must** show your working.

[3 marks]

$$1.5 \text{ kg} = 2.2 \times 1.5 = 3.3 \text{ pounds.}$$

$$2 \div 12 = \frac{1}{6} \text{ of a pound per portion.}$$

$$\frac{1}{6} \times 21 = 3.5 \text{ pounds for 21 portions.}$$

So Alex does not have enough for 21 portions.

Question 8 continues on the next page

Turn over ►



8 (c) Sophie has a hutch for her pet rabbit.

The floor area of the hutch is 4.46 m^2

Sophie builds a new hutch with the floor in the shape of a regular octagon.

$$\text{Area of a regular octagon} = 2s^2(1 + \sqrt{2})$$

where s is the side length

The side length of the floor of the new hutch is 1.1 m

How much bigger is the floor area of the new hutch than the floor area of the old hutch?

[3 marks]

$$s = 1.1$$

$$\text{Area} = 2 \times 1.1^2 \times (1 + \sqrt{2}) = 5.84239 \dots$$

$$5.8424 - 4.46 = 1.3824$$

Answer 1.3824 m^2

9

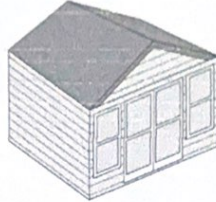


9 Summer house

Lisa is buying a summer house for her garden.

9 (a)

Summer house	£5964
Delivery charge	£2.25 per mile

**Payment plan**

Deposit of $\frac{2}{7}$ of the total price including delivery
then 12 equal monthly payments

Lisa buys the summer house, with a delivery charge for 84 miles.
She uses the payment plan.

Work out the deposit and the amount of each monthly payment.

[6 marks]

$$\begin{aligned} \text{Delivery cost} &= 84 \times 2.25 = \pounds 189. \\ \text{Total cost} &= 5964 + 189 = \pounds 6153. \\ \text{Deposit} &= 6153 \times \frac{2}{7} = \pounds 1758. \\ \text{Left to pay} &= 6153 - 1758 = \pounds 4395. \\ \text{Monthly payment} &= 4395 \div 12 = \pounds 366.25. \end{aligned}$$

Deposit £ 1758.

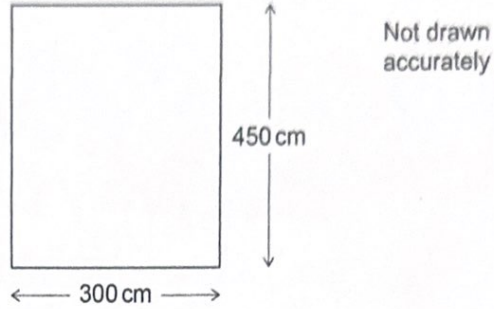
Monthly payment £ 366.25

Turn over ►



Do not write outside the box

9 (b) The base of the summer house has dimensions 300 cm by 450 cm

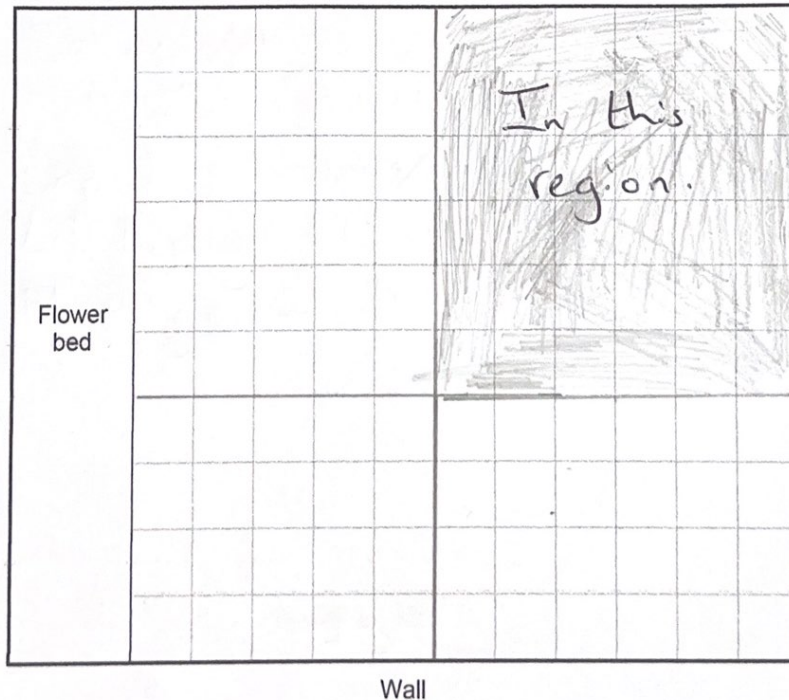


Lisa's garden is drawn to a scale of 1 to 100 on a centimetre grid.
 There is a wall at the bottom of the garden and a flower bed down one side.
 Lisa wants to put the summer house
 at least 400 cm from the wall
 and
 at least 500 cm from the flower bed.

On the centimetre grid, show where Lisa can put the summer house.

[3 marks]

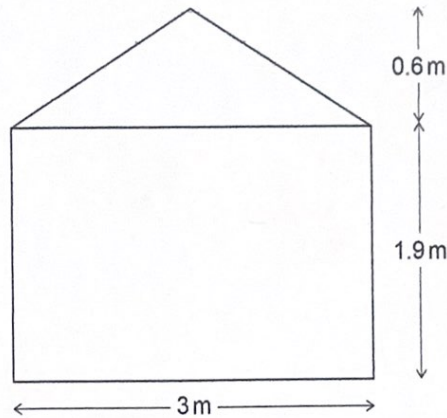
Scale: 1 to 100



- 9 (c) Lisa is buying a heater for the summer house.
To work out the correct heater size she uses the formula

$$\text{Minimum heater size (kW)} = \text{area of the front (m}^2\text{)} \times \text{length (m)} \times 0.058$$

Here is the front view of the summer house.



Not drawn
accurately

The length of the summer house is 4.5m

Lisa can buy a 1kW heater or a 2kW heater.

Which heater should she buy?

You **must** show your working.

[5 marks]

$$\text{Area of rectangle} = 3 \times 1.9 = 5.7 \text{ m}^2$$

$$\text{Area of triangle} = \frac{1}{2} \times 3 \times 0.6 = 0.9 \text{ m}^2$$

$$\text{Total area of front: } 6.6 \text{ m}^2$$

$$\begin{aligned} \text{Minimum heater size} &= 6.6 \times 4.5 \times 0.058 \\ &= 1.7226 \text{ kW} \end{aligned}$$

She should then buy the 2kW heater.

Answer 2kW.



10 Earnings and saving

- 10 (a) Jamal works for a company.
His normal rate of pay is £9.50 per hour.
His overtime rate of pay is 1.5 times his normal rate.
One week, Jamal works
38 hours at his normal rate
and
6 hours overtime.

From his earnings, the company deducts
Income Tax at 20% on his earnings over £242
National Insurance at 12% on his earnings over £184

Work out Jamal's net pay that week, after Income Tax and National Insurance are deducted.

[7 marks]

$$\text{Jamal's overtime pay} = 9.50 \times 1.5 = \pounds 14.25/\text{hr.}$$

$$\text{Total weeks pay} = 38 \times 9.50 + 6 \times 14.25$$

$$= \pounds 446.50.$$

$$\text{Taxable: } 446.5 - 242 = \pounds 204.50$$

$$\text{Tax: } 204.50 \times 0.2 = \pounds 40.9$$

$$\text{National Insuranceable: } 446.5 - 184 = \pounds 262.50$$

$$\text{N.I: } 262.50 \times 0.12 = \pounds 31.50.$$

$$\text{Net pay} = 446.5 - 40.9 - 31.5$$

$$= \pounds 374.10.$$

Answer £ 374.10.



- 10 (b) Jamal decides to put £2500 in a savings account for 3 years.
He compares the interest paid by two banks.

Bank A

1.4% compound
interest per year

Bank B

Year 1 – no interest added
Year 2 – £49.15 interest added
Year 3 – £56.30 interest added

Which bank should Jamal choose, A or B?

You **must** show your working.

[5 marks]

$$\text{Bank A: } 2500 \times 1.014^3$$

$$= \pounds 2606.48.$$

$$\text{Bank B: } 2500 + 49.15 + 56.30$$

$$= \pounds 2605.45.$$

Therefore bank A will net Jamal
more interest.

Answer Bank A.

12

Turn over ►



11 Soft Play Centre

- 11 (a) At a soft play centre one morning,
there are 6 staff on duty
the ratio of staff to children is 2 : 17
35 of the children are aged under 7

How many of the children are aged 7 or over?

[4 marks]

$$\begin{array}{l} \text{staff : Children} \\ \times 3 \quad \left(\begin{array}{l} 2 : 17 \\ \hline 6 : 51 \end{array} \right) \times 3 \end{array}$$

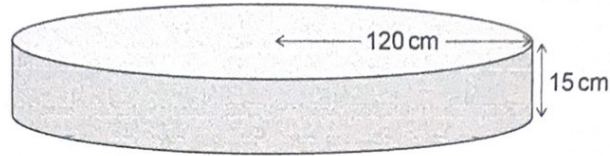
There are 51 children total.

$51 - 35 = 16$ children aged 7 and
over.

Answer 16



- 11 (b) A new sand pit is built at the soft play centre.
The sand pit is in the shape of a cylinder of radius 120 cm
The sand pit will be filled with play sand to a depth of 15 cm



Play sand is sold in 50-litre bags and each bag costs £9.97

$$1 \text{ litre} = 1000 \text{ cm}^3$$

How much will it cost to buy enough bags of sand to fill the sand pit to a depth of 15 cm?

[6 marks]

$$\begin{aligned} \text{Area of the cylinder is } \pi \times 120^2 \times 15 \\ = 678584.01 \text{ cm}^3 \\ = 678.584 \text{ L.} \end{aligned}$$

$$\begin{aligned} \text{Bags needed} &= 678.584 \div 50 \\ &= 13.57 \dots \text{ bags.} \end{aligned}$$

$$\begin{aligned} \text{Therefore 14 bags are needed.} \\ \text{Cost} &= 14 \times 9.97 = \pounds 139.58. \end{aligned}$$

$$\text{Answer } \pounds \underline{139.58.}$$

Turn over ►



- 11 (c) The table shows the ages of children at the centre one day.

Age	Number of children
3 and under	8
4-6	15
7-9	13
10 and over	4

One of the children is chosen at random to win a free soft play visit.

The manager says,

"The probability that the child is aged 7-9 is **more than** $\frac{3}{10}$ "

Is the manager correct?

You **must** show your working.

[3 marks]

$$\text{Total Children} = 8 + 15 + 13 + 4 = 40.$$

$$\text{Probability} = \frac{13}{40}.$$

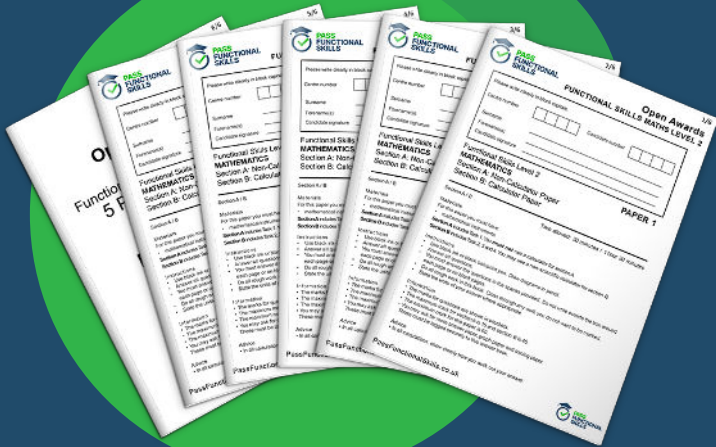
$$\frac{3}{10} = \frac{12}{40} < \frac{13}{40}.$$

So yes, the manager is correct.

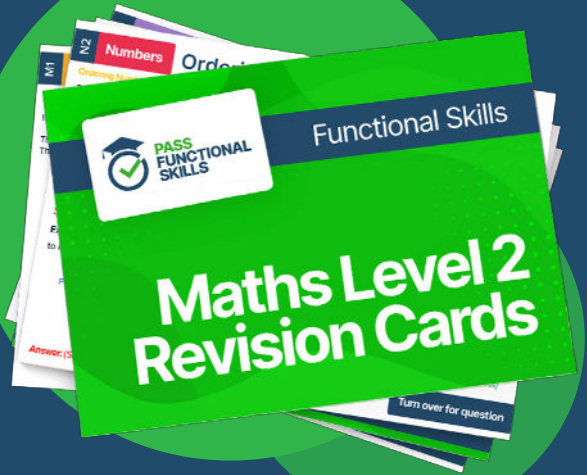




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