Bishops Online Tutoring

Education Consultancy

Edexcel GCSE Mathematics
FUNCTIONAL MATHS

Materials Required:

- Pen
- HB Pencil
- Ruler (in centimetres and millimetres)
- Protractor
- Compass

Instructions:

- Use a black ink pen to answer all questions
- Fill your name in the section below
- Answer the questions in the spaces provided
- Show your working out for all answers

Information:

- The marks allocated for each question are displayed within brackets – utilise this information to gauge the appropriate amount of time to dedicate to each question
- Questions marked with an asterisk (*) will assess your written communication; be careful of spelling, punctuation and grammar with these questions

Advice:

- Carefully read the question before attempting to answer it
- Be vary of time and try to answer every question
- If you have enough time in the end, go back and check your answers. A good way to check your answers is to retry the question with the hope of getting the same answer as before without looking at your working out from before

CALCULATOR ALLOWED

NAME:	

1. The diagram shows a patio in the shape of a rectangle.

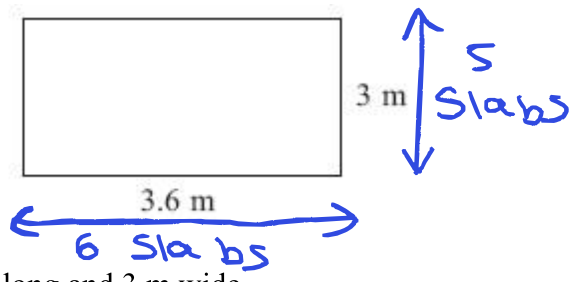

Diagram **NOT** accurately drawn

The patio is 3.6 m long and 3 m wide.

Matthew is going to cover the patio with paving slabs.
Each paving slab is a square of side 60 cm.

Matthew buys 32 of the paving slabs.

(a) Does Matthew buy enough paving slabs to cover the patio?
You must show all your working.

3.6m = 360cm 360 ÷ 60 = 6
3m = 300cm 300 ÷ 60 = 5

5 × 6 = 30 slabs required
So he has enough slabs.
He will have 2 slabs left.

Yes

(3)

The paving slabs cost £8.63 each.

(b) Work out the total cost of the 32 paving slabs.

Non-calc

863
× 32
1726
25890
27616 → 276.16

Calc

32 × 8.63
= £276.16

£ 276.16

(3)

(6 marks)

***2.** Mr Weaver's garden is in the shape of a rectangle.

In the garden there is a patio in the shape of a rectangle and two ponds in the shape of circles with diameter 3.8 m.

The rest of the garden is grass.

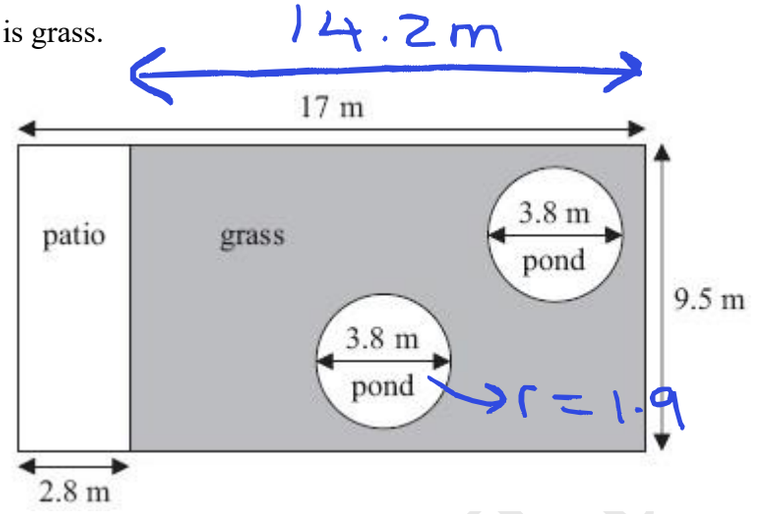

Diagram **NOT** accurately drawn

Mr Weaver is going to spread fertiliser over all the grass.
One box of fertiliser will cover 25 m2 of grass.

How many boxes of fertiliser does Mr Weaver need?
You must show your working.

- Grass with pond area

$14.2 \times 9.5 = 134.9 m^2$

- Area of 2 ponds

Area of circle $= \pi r^2$

$= \pi \times 1.9^2$

$= \frac{361}{100}\pi$ → multiply by 2 because there's two ponds

$= \frac{361}{50}\pi \, m^2$

- Grass Area only

$134.9 - \frac{361}{50}\pi = 112.21770 1 m^2$

- No. of boxes

$112.21770 1 \div 25 = 4.489$ boxes needed

↳ 5 boxes needed

(5 marks)

***3.** Henry is thinking about having a water meter.

These are the two ways he can pay for the water he uses.

Water Meter	No Water Meter
A charge of £28.20 per year **plus** 91.22p for every cubic metre of water used **1 cubic metre = 1000 litres**	A charge of £107 per year

Henry uses an average of 180 litres of water each day.

Henry wants to pay as little as possible for the water he uses.
Should Henry have a water meter?

Water Meter

180 × 365 = 65700 liters
= 65.7 cubic metre

91.22 × 65.7 = 5993.154p
= £59.93

59.93 + 28.20
= £88.13
↓
Total payment

No water Meter

£107
↓
Total Payment

He should get the water meter as it is cheaper.

(5 marks)

***4.** Here is part of Gary's electricity bill.

Electricity bill	
New reading	7155 units
Old reading	7095 units
Price per unit 15p	

Work out how much Gary has to pay for the units of electricity he used.

7155
−7095
60

He has used 60 units

60 × 15 = 900pence

= £9.00

(4 marks)

5. Peter works out the cost of the gas he used last year.
At the start of the year, the gas meter reading was 12967 units.
At the end of the year, the gas meter reading was 14059 units.
Each unit of gas he used cost 44p.

Work out the mean cost per month of the gas he used last year.

14059 − 12967 = 1092 → units used in one year

1092 × 44 = 48048p → £480.48

480.48 ÷ 12 = 40.04

£ 40.04

(5 marks)

6. Here is a diagram of Jim's garden.

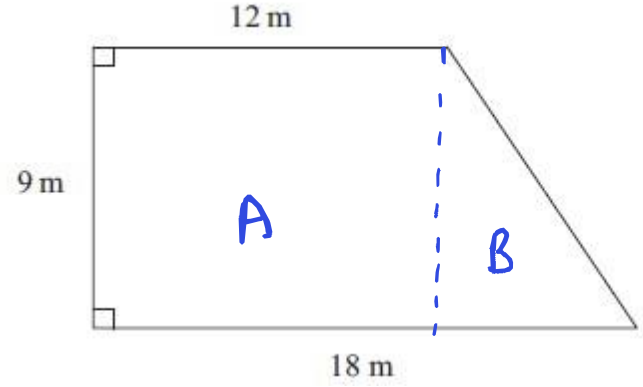

Diagram **NOT** accurately drawn

Jim wants to cover his garden with grass seed to make a lawn.

Grass seed is sold in bags.
There is enough grass seed in each bag to cover 20 m^2 of garden.

Each bag of grass seed costs £4.99

Work out the least cost of putting grass seed on Jim's garden.

(A) Area

$9 \times 12 = 108 m^2$

(B) Area

$\frac{1}{2} \times 9 \times 6 = 27 m^2$

(A) + (B) Area

$108 + 27 = 135 m^2$ → Total Area

$135 \div 20 = 6.75$ bags needed

↳ Round up = 7 bags

$7 \times 4.99 = £34.93$

£ 34.93

(5 marks)

7. Jon has a flower garden in the shape of a circle.
The diameter of the garden is 5 metres.

Jon wants to put fencing around the edge of the garden.
The fencing costs £1.80 per metre.

Work out the total cost of the fencing.

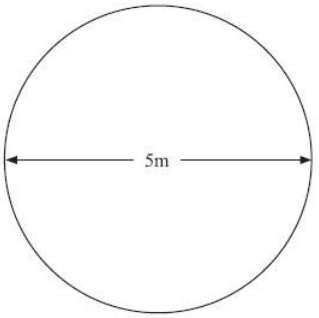

Diagram **NOT** accurately drawn

Circumference = πd
$= \pi \times 5$
$= 15.707963 27$

Cost $= 15.70796327 \times 1.80$
$= 28.27743$
$\rightarrow £28.27$

£ 28.27

(5 marks)

8. The diagram shows a CD.
The CD is a circle of radius 6 cm.

CDs of this size are cut from rectangular sheets of plastic.
Each sheet is 1 metre long and 50 cm wide.

Work out the greatest number of CDs that can be cut from one rectangular sheet.

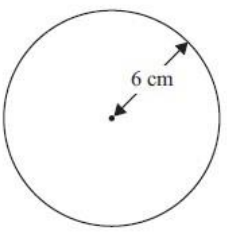

Diagram **NOT** accurately drawn

1m = 100cm.
$100 \div 12 = 8.3$.
$50cm \div 12 = 4.16$.

$8 \times 4 = 32$

32

(4 marks)

***9.** Jenny fills some empty flowerpots completely with compost.

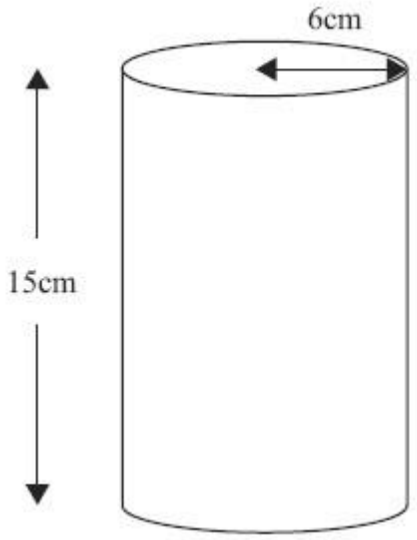

Diagram **NOT** accurately drawn

Each flowerpot is in the shape of a cylinder of height 15 cm and radius 6 cm.
She has a 15litre bag of compost.

She fills up each flowerpot completely.
How many flowerpots can she fill completely?
You must show your working.

Volume of cylinder $= \pi r^2 h$

$= \pi (6)^2 (15)$

$= 540\pi$

$= 1696.460033 cm^3$

15 litre bag holds $= 15 \times 1000 cm^3 = 15000$

$15000 \div 1696.460033 = 8.841941$

She can only fit 8 completely.

8

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(6 marks)