Write your name here

Surname		Other names

AQA | Edexcel
Level 1/Level 2 GCSE (9 - 1)

Centre Number

Candidate Number

Problem solving   Grade 4
GCSE 9 -1

Higher Tier

www.TheMathsProfessor.com

Time: 1 hour

Paper Reference
TYPE 1

Total Marks

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

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.
- Answer **all** questions.
- Answer the questions in the spaces provided
- – *there may be more space than you need.*
  Calculators may not be used.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out**.

Information

- The total mark for this paper is 57
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

S48572A

S48572A0120

PEARSON

▶

Turn over

1. Asim is going to cover a bathroom wall with tiles.
The wall is in the shape of a rectangle.

The wall is 1.8 m long and 2.4 m high.

The tiles are squares with sides of 30 cm.
There are 14 tiles in a box.

How many boxes of tiles does Asim need?
You must show all your working.

Area of wall is 1.8 x 2.4 = 4.32 m^2

Area of tile = 0.3m x 0.3m = 0.09m^2

4.32 divided by 0.09 = 48

So Asim needs 48 tiles.

48 divided by 14 = 3.42

So Asim needs 4 boxes of tiles!

....

(Total 5 marks)

2. James is going to cover a rectangular floor with flooring.

The floor has a length of 6 m.
It has a width of 4.5 m.

Flooring is sold in packs.
One pack of flooring covers an area of 1.44 m².

Each pack costs £12.87

James buys the least number of packs so that he has enough flooring to cover the floor.

Work out how much money James pays for the flooring.

Area of the floor is 6 x 4.5 = 27 m^2

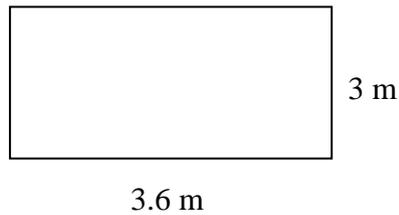**27 divided by 1.44 gives us the amount of packs James needs which = 18.75**

So James needs 19 packs as 18 would be too few.

19 x 12.87 = 244.53

£ ....

(Total 4 marks)

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

3 m

3.6 m

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.

3.6 x 3 = 10.8m² which is the total area of the patio.
0.6m x 0.6m = 0.36m² is the area of each slab.
10.8 divided by 0.36 gives 30 which means that Matthew needs 30 slabs.
So yes he does have enough!

#welldoneMatthew

....
(3)

The paving slabs cost £8.63 each.

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

32 x 8.63 = £276.16

£ ....
(3)

(Total 6 marks)

4.   The diagram shows Bob's bathroom wall.

3 m

5 m
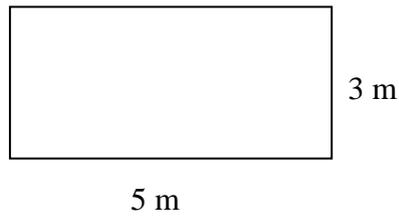
The wall has a length of 5 m.
The wall has a height of 3 m.

Bob is going to cover the wall with tiles.
He is going to use square tiles of side 25 cm.

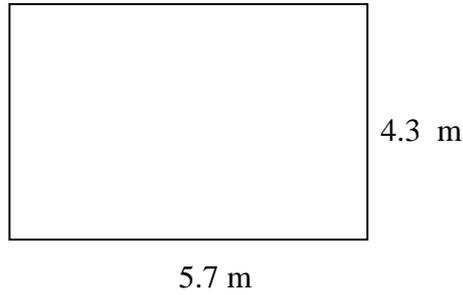How many tiles will Bob have on the bathroom wall?

Total area of wall is 5 x 3 = 15m^2

0.25m x 0.25m = 0.625m^2 which is the area of each tile

15 divided by 0.625 is 24 so Bob will have 24 tiles on the wall.

....

(Total 3 marks)

5. Here is a sketch of the floor of a room.

4.3 m

5.7 m

(a) Work out the perimeter of the floor.

5.7 + 4.3 + 5.7 + 4.3 = 20 m

.... m

(1)

(b) Work out the area of the floor.

5.7 x 4.3 = 24.51

.... m^2

(2)

Madhiya wants to cover the floor with carpet tiles.
She needs 80 carpet tiles to cover the floor.

Carpet tiles are sold in boxes.
There are 12 carpet tiles in each box. Each box costs £12.71

(c) What is the total cost of the tiles?

80 divided by 12 is 6.6666 which means Madhiya needs 7 boxes
7 x 12.71 = 88.97
We do this final multiplication because it's the number of boxes multiplied by the cost of each box

.... boxes

(3)

6.   Here is a diagram of a wall.

WALL   4 m

5 m
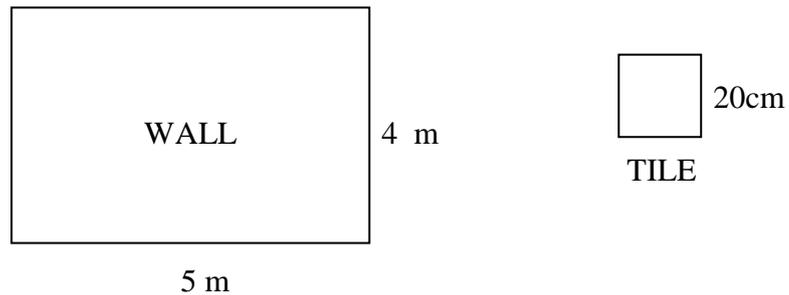
20cm

TILE

Halima wants to cover the entire wall with tiles.

The tiles are squares with sides of length 20 cm.

The tiles are sold in packs.
There are 10 tiles in each pack.
Each pack of tiles costs £34.99

Halima only has £1000

Can she buy enough packs of tiles to cover the wall?

Area of wall = 4 x 5 = 20m^2
Area of tile = 0.2m x 0.2m = 0.04m^2 NB: I converted 20cm to m
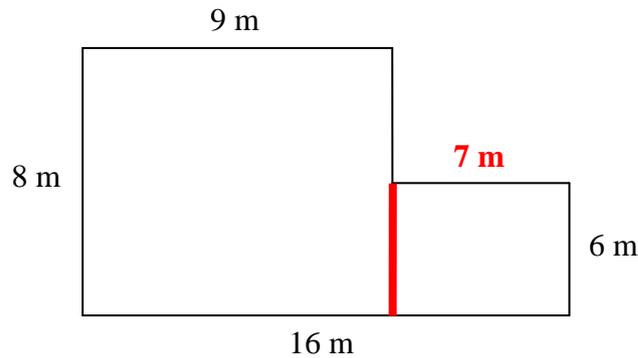**20 divided by 0.04 = 500 so she needs 500 tiles**
If there are 10 in a pack then 500 divided by 10 = 50. She needs 50 packs
34.99 x 50 = 1749.5
No she does not have enough

(Total 6 marks)

7. The diagram shows the floor of a village hall.

9 m

8 m

7 m

6 m

16 m

The caretaker needs to polish the floor.

One tin of polish normally costs £19.
One tin of polish covers 12 m^2 of floor.

There is a discount of 30% off the cost of the polish.

The caretaker has £130.

Has the caretaker got enough money to buy the polish for the floor?
You must show all your working.

Area of big rectangle = 9 x 8 = 72m^2
Area of small rectangle = 7 x 6 = 42m^2
Total area = 114m^2

114 divided by 12 tells how many tins we need = 9.5
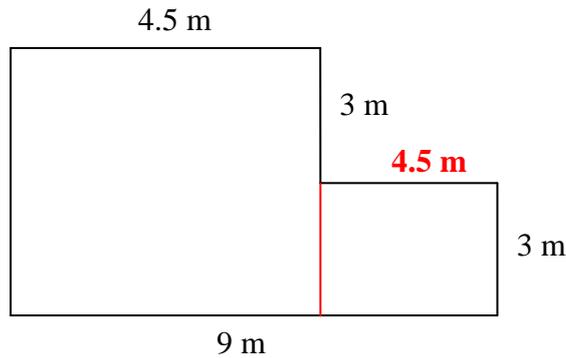**This means 10 tins as 9 tins would mean we run out!**

10 tins x 19 = £190
30% off 190 means 190 x 0.7 = 133

So the caretaker does not have enough ☹

(Total 5 marks)

8. The diagram shows the plan of a floor.

4.5 m

3 m

4.5 m

3 m

9 m

All the corners of the floor are right angles.
Jason wants to cover the floor completely with underlay.

Underlay is sold in rolls.
Each roll of underlay has a length of 5 m and a width of 1.5 m.

Each roll of underlay costs £59.99
Jason has £400 to spend.

Does Jason have enough money to buy the underlay he needs?

Area of big rectangle is 4.5 x 6 as the total height is 6 which = 27m^2
Area of smaller rectangle is 4.5 x 3 = 13.5m^2
Total area = 40.5m^2

Area of underlay is 5 x 1.5 = 7.5m^2
40.5 divided by 7.5 = 5.4 which means we need 6 rolls as 5 would be too few.

6 x 59.99 = £359.94

So yes Jason does have enough.

(Total 4 marks)

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

12 m

9 m

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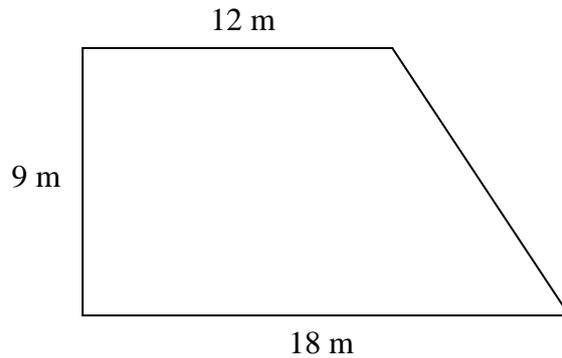
Jim wants to cover his garden with grass seed to make a lawn.

Grass seed is sold in bags.
There is enough grass seed in each bag to cover 20 m^2 of garden.
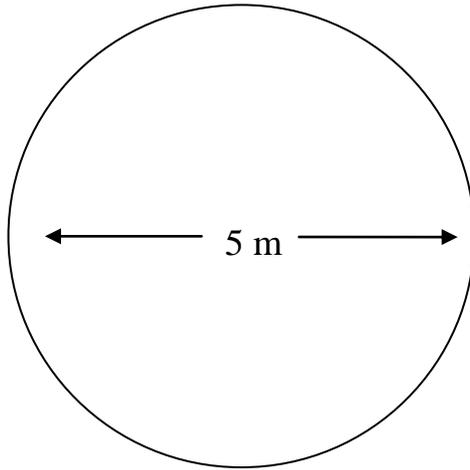
Each bag of grass seed costs £4.99

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

Area of trapezium = 18 + 12 = 30. 30 divided by 2 = 15. 15 x 9 = 135 m^2
135 divided by 20 = 6.75 so we need 7 bags
7 x 4.99 = £34.93

£ ....

(Total 4 marks)

10.

5 m

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.
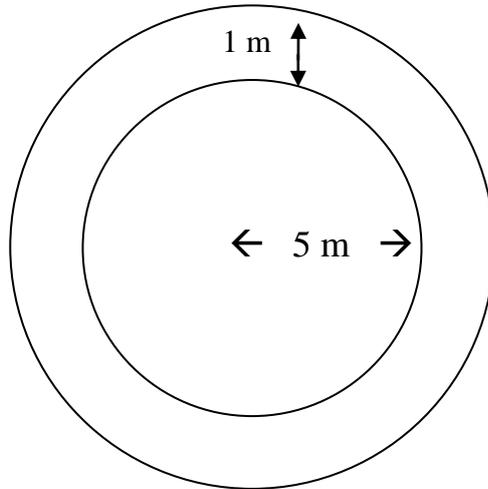
Circumference is pi x diameter = 3.142 x 5 = 15.7 m

So we need 16 metres as 15 would be too few.

16 x 1.80 = £28.80

£...

(Total 3 marks)

11. The diagram shows a circular pond with a path around it.

The pond has a radius of 5m.
The path has a width of 1m.

Work out the area of the path.
Give your answer correct to 3 significant figures.

Big circle = pi x 6^2 = 113
Smaller circle is pi x 5^2 = 78.53

By subtraction = 34.47

.... m^2

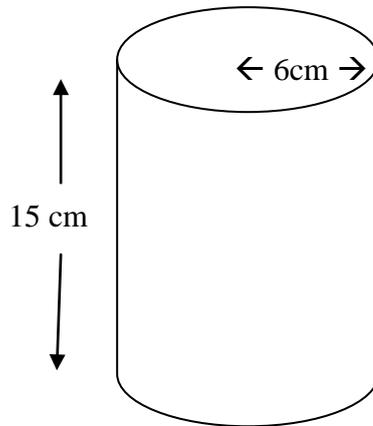**(3)**

Grass costs £2.95 per square metre.
What is the cost of putting grass onto the path?

We would need 35 square metres as 34 is too few so 35 x 2.95 = 103.25

£..

(2)

12. Jenny fills some empty flowerpots completely with compost. She then plants seeds into each flowerpot so she can sell them at the local market.

Each flowerpot is in the shape of a cylinder of height 15 cm and radius 6 cm.
She has a 15 litre bag of compost.
She fills up each flowerpot completely.
How many flowerpots can she fill completely?

Volume = pi x 36 x 15 = 1696.46

15 litre bag = 15000 cm³

15000 divided by 1696.46 = 8.84

This means we can only fill 8 flowerpots as there isn't enough for the 9th

....

(5)

She wants to sell each seeded flowerpot for £1.95.
How much money can she expect to make?

8 x 1.95 = £15.6

£ ....

(1)