Level 1 / Level 2 GCSE (9 – 1)

MATHEMATICS

Paper 3 (Calculator)

Foundation Tier

Time : 1 hour 30 minutes   **Paper : 1 MA1 / 3F**

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.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

- The total mark for this paper is 80.
- 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.

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1. Change 5800 grams into kilograms.

………………………………...

(Total for Question 1 is 1 mark)

2. Work out $\frac{1}{7}$ of 91.

………………………………...

(Total for Question 2 is 1 mark)

3. Write 65% as a fraction.

………………………………...

(Total for Question 3 is 1 mark)

4. Work out 4.8^2

………………………………...

(Total for Question 4 is 1 mark)

5. Here are four numbers

$$-8 \qquad -3 \qquad 3 \qquad 8$$

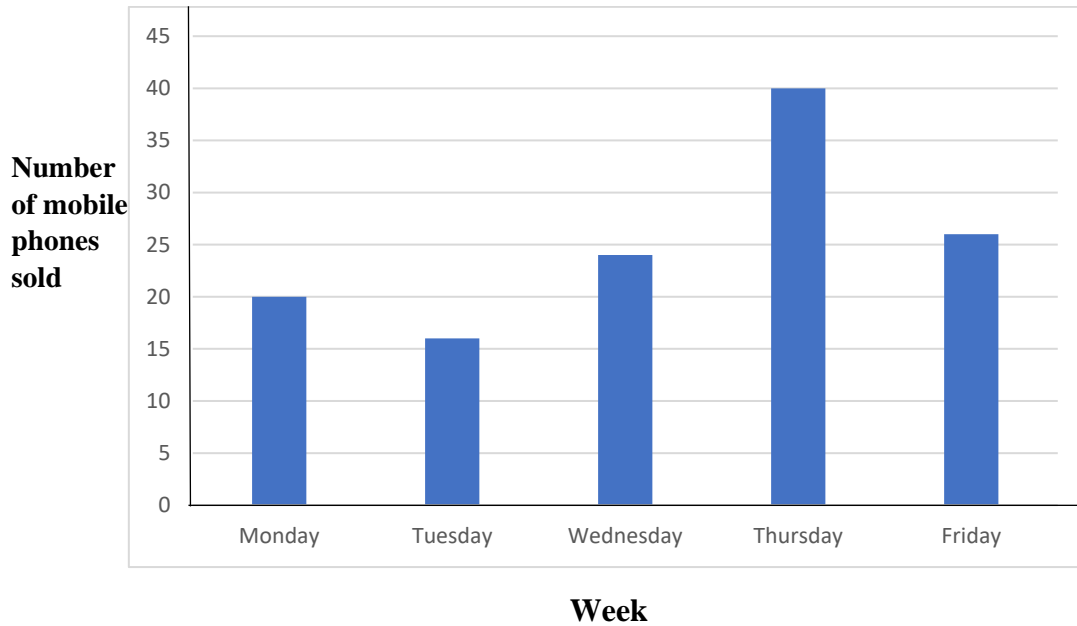Write one of these numbers in each box to make a correct calculation

☐ + ☐ = −5

………………………………...

(Total for Question 5 is 1 mark)

6. The bar chart shows information about the number of mobile phones sold in a shop on each of five days.

Number of mobile phones sold

Week

a. On which day did the shop sell the greatest number of mobile phones?

…………………………………

(1)

b. On which day did the shop sell 8 mobile phones more than the previous day?

………………………………..

(1)

(Total for Question 6 is 2 marks)

7.
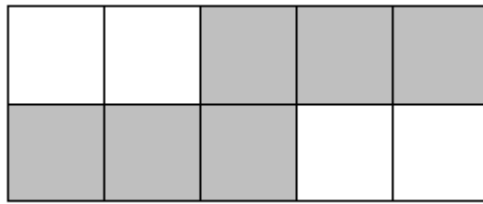
   a. What percentage of this shape is shaded?

………………………………..

(2)

   b. Write your answer to part (a) as a decimal.

…………………………………

(1)

(Total for Question 7 is 3 marks)

_____

8. Barbie buys 96 macarons for her birthday party.

She buys macarons in packs of 12 macarons.
Each pack of 12 macarons costs £19.95.

Work out how much Barbie pays for the 96 macarons.

………………………………..

(Total for Question 8 is 3 marks)

_____

9. a. Find the value of $(1.5 - 0.3)^2 + \sqrt{40.96}$

…………………………………….

(2)

b. Write down the reciprocal of $\frac{2}{5}$

……………………………………..

(1)

(Total for Question 9 is 3 marks)

10. A ball is projected vertically upwards from the balcony of a house.

t seconds after being projected, the height of the ball above the ground is h metres.

The diagram shows the graph of h against t, for $h = 0.7(5 + 4t - t^2)$
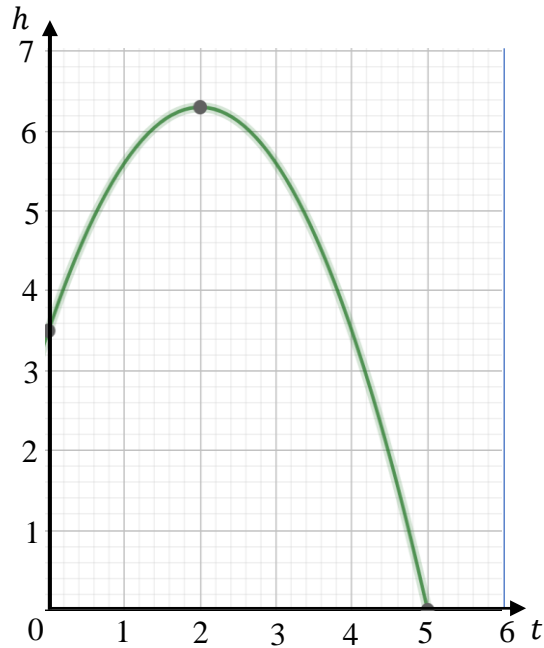
Using the graph, find

a.   the height above the ground from which the ball was projected.

…………………………………
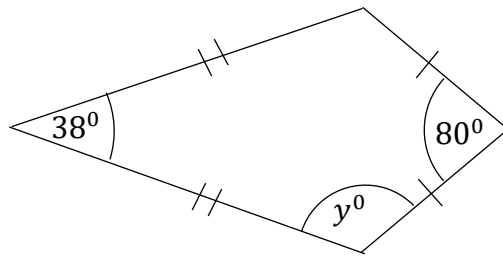
(1)

b.   the maximum height of the ball

…………………………………

(1)

c.   the total time for which the ball was at least 5.6 m above the ground.

…………………………………

(1)

(Total for Question 10 is 3 marks)

11.

The diagram shows a kite.
Work out the value of y.

………………………………..

(Total for Question 11 is 3 marks)

12. Here are the first five terms of a number sequence.

23   27   31   35

a. i. Write down the next two terms of the sequence

………………………………..

(1)

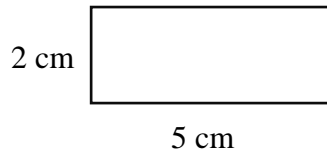A term of this sequence is 67.

ii. Which term?

…………………………….

(1)

c.   Explain why 117 cannot be a term of the sequence.
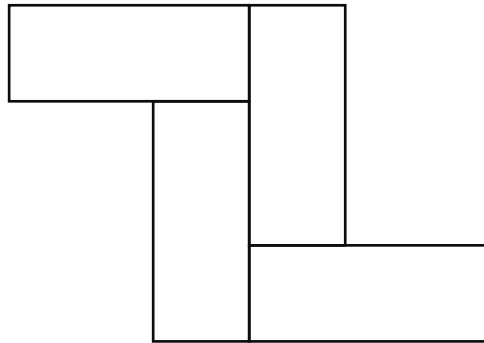
………………………………..

(1)

(Total for Question 12 is 3 marks)

13. Here is a rectangle.

2 cm

5 cm

4 of these rectangles are used to make this 8-sided shape.

Work out the perimeter of this shape.

…………………………………..

(Total for Question 13 is 2 marks)

14. a. Simplify $2a - 3b - a - b$

………………………………….
(2)

b. Solve $6p - 5 = 7$

…………………………………..
(2)

(Total for Question 14 is 4 marks)

15. Here are the costs of the same type of toilet rolls in two supermarkets.

A1 Supermarket
toilet tissue 9 rolls for £4.95

B1 Supermarket
toilet tissue 4 rolls for £2.25

Sally needs to buy at least 24 toilet papers.

She must buy toilet papers in whole packs.

Sally wants to buy the toilet rolls as cheaply as possible from the same supermarket.

Which supermarket should she buy the toilet rolls from, A1 supermarket or

B1 supermarket?

You must show all your working.

....

(Total for Question 15 is 4 marks)

16. There are 30 counters in a bag.

a. 5 of the counters are blue.
   11 of the counters are red.
   The rest of the counters are yellow.

   Frank takes at random a counter from the bag.
   Work out the probability that Frank takes a yellow counter.

………………………………..
(2)

b. The probability that Zakir scores a penalty is 0.85.
   Zakir is going to take 20 penalties in one season.
   Work out an estimate for the number of times Zakir will score.

………………………………..
(2)

(Total for Question 16 is 4 marks)

17. *PQR* is a triangle
PR = 4.5 cm and *QR* = 10.2 cm
Use a ruler and compasses to construct the triangle *PQR* with *PQ* as its base.
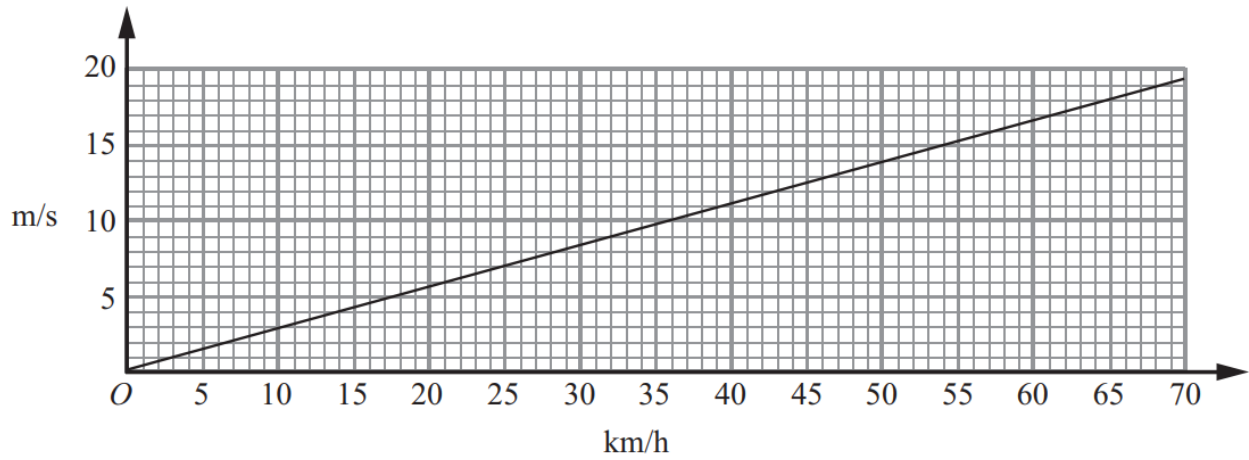You must show all construction lines.

_____

8 cm

(Total for Question 17 is 2 marks)

18. The graph can be used to convert kilometres per hour (km/h) and metres per second (m/s).

a. Use your graph to convert 15 m/s to km/h.

………………………………….km/h

(1)

Ben travels from London to Brighton at an average speed of 90 km/h.

b. Work out the average speed in m/s that Ben travelled from London to Brighton.

…………………………………..m/s

(2)

(Total for Question 18 is 2 or 3 marks)

19. Here are the types of nut trees Caterina counted one day.

Nut trees	
Cashew	
Walnut	21
Almond	
Pistachio	16

21 walnut nut trees were counted.
The ratio of number of almond nut trees to the number of walnut nut trees is 5 : 7

a. Work out the number of almond nut trees.

…………………………………..

(2)

The number of cashew trees was 75% of the number of pistachio trees.

b. Work out the number of cashew trees.

…………………………………..

(2)

(Total for Question 19 is 4 marks)

20. Three tins *P*, *Q* and *R* each have buttons.
Tin *P* contains *x* buttons.
Tin *Q* contains 72 buttons.
Tin *R* contains 7 fewer buttons than tin *P*.

The mean number of buttons in the three tins is 39.
Work out the number of buttons in tin *R*.

………………………………..

(Total for Question 20 is 3 marks)

21. Andy tests a coin by spinning it 10 times and gets 7 tails.

a. Explain why he thinks the coin might be biased.

……………………………………………………………………………………………
……………………………………………………………………………………………
……………………………………………………………………………………………

(1)

He spins the same coin 200 times and gets 104 tails.

b. Explain why he now thinks the coin is fair.

……………………………………………………………………………………………
……………………………………………………………………………………………
……………………………………………………………………………………………

(1)

c. Which is his most accurate estimate of the experimental probability of getting a tail?
Explain.

……………………………………………………………………………………………
……………………………………………………………………………………………
……………………………………………………………………………………………

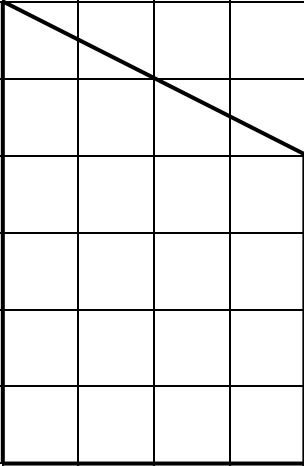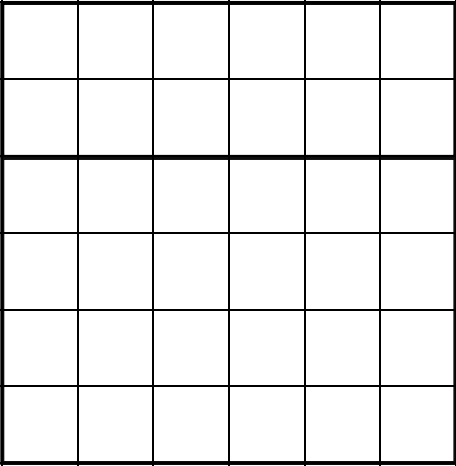**(1)**

(Total for Question 21 is 3 marks)

22. The side elevation and the front elevation of a solid prism are drawn on the grid.
On the grid, draw the plan of the solid prism.

Side elevation   **Front elevation**

(Total for Question 22 is 2 marks)

23. a. Simplify $2p \times 3q$

....

(1)

b. Simplify $\frac{2a^2b}{8ab^3}$

....

(2)

c. Solve $2y + 7 < 2$

....

(2)

(Total for Question 23 is 5 marks)

24.

30 km   40 km

P   *Q*   *R*
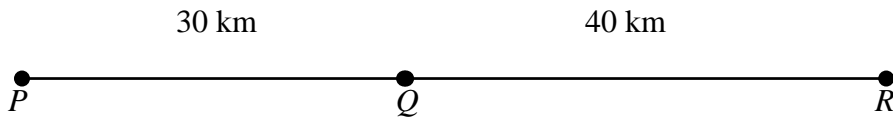
P, *Q* and *R* are 3 service stations on a motorway.

PQ = 30 km

QR = 40 km

Ben drives along the motorway from *P* to *R*.

Ben drives at an average speed of 72 km/h from *P* to *Q*.

Ben drives at an average speed of 75 km/h from *Q* to *R*.

Work out the difference in the time ben takes to drive from *P* to *Q* and the time Ben takes to drive from *Q* to *R*.

………………………………..

(Total for Question 24 is 3 marks)

25. A number, *y*, is 11 when rounded to 2 significant figures.

Write down the error interval.

………………………………..

(2)

(Total for Question 25 is 2 marks)

26. This is a plan of Rose's bedroom.

6 m

4 m

$2\frac{3}{4}$ m

4 m
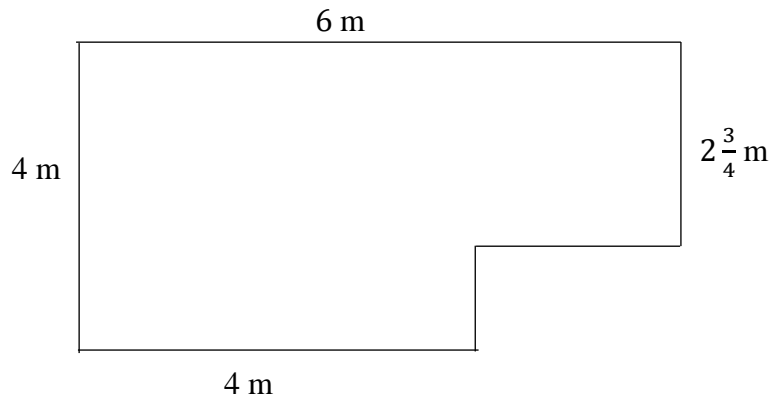
She wants to tile the floor.

The tiles are 50 cm by 50 cm.

There are 30 tiles in each box.

How many boxes will she need to cover her floor?
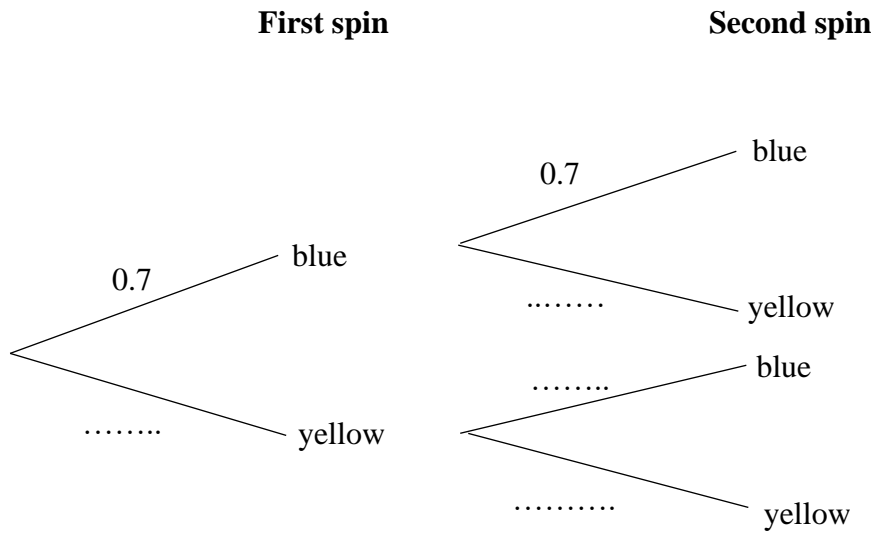
…………………………..

(Total for Question 26 is 4 marks)

27. Jerry makes a spinner.
The spinner can land on blue or on yellow.
The probability that the spinner will land on blue is 0.7
Jerry spins the spinner twice.
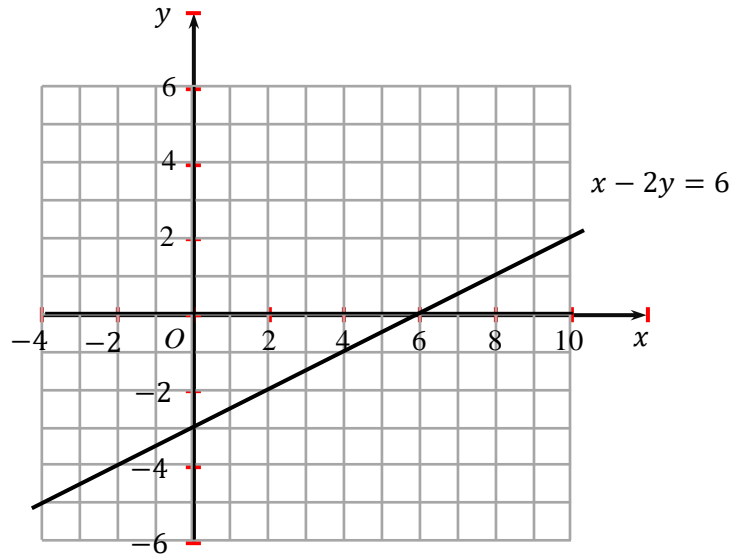
    a. Complete the probability tree diagram.

First spin   **Second spin**

                                                 0.7   blue

                  blue

     0.7

                             ..……   yellow

                                  ……..   blue

    ……..   yellow

                               ………..   yellow

(2)

    b. Work out the probability that the spinner lands on one of each colour.

…………………………………….

(2)

(Total for Question 27 is 4 marks)

28.

The graph of the straight line $x - 2y = 6$ is shown on the grid.

a. On the grid draw $y = -x$

(2)

b. Use your graphs to solve the simultaneous equations
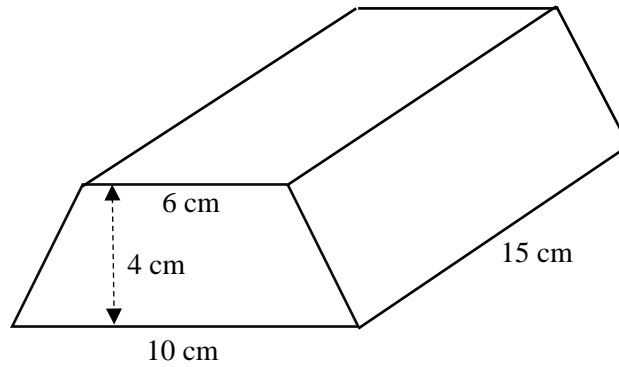$$x - 2y = 6$$
$$y = -x$$

$x =$……………………………..

$y =$……………………………..

(1)

(Total for Question 28 is 3 marks)

29.

The diagram shows a solid prism made from wood.
The cross-section of the prism is a trapezium.
The parallel sides of the trapezium are 6 cm and 10 cm.
The height of the trapezium is 4 cm.
The length of the prism is 15 cm.

The density of the wood is 0.8 g/cm^3
Calculate the mass of the prism.

.... g

(Total for Question 29 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS