Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
November 2023

# Mathematics

StemUp Model Solution

Unit M6 Paper 1
**(Non-Calculator)**
Foundation Tier

**[GMC61]**



*GMC61*

## THURSDAY 23 NOVEMBER, 9.15 am – 10.15 am

**TIME**

1 hour.

**INSTRUCTIONS TO CANDIDATES**

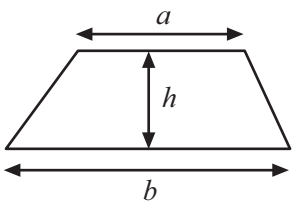
Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
**You must answer the questions in the spaces provided.**
**Do not write outside the boxed area on each page, on blank pages or tracing paper.**
Complete in black ink only. **Do not write with a gel pen.**
Answer **all seventeen** questions.
All working should be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions.
You **must not** use a calculator for this paper.

**INFORMATION FOR CANDIDATES**

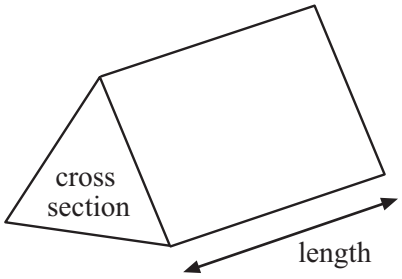
The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a ruler, compasses and a protractor.
The Formula Sheet is on page 2.

# Formula Sheet

**Area of trapezium** $= \frac{1}{2}(a + b)h$




**Volume of prism** = area of cross section × length








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**1** Here are some metric and imperial units.

**miles** **pints** **kilograms** **millimetres**

Write them in the correct place in the table below.

| Metric units | Imperial units |
|---|---|
| kilograms | miles |
| millimetres | pints |

[2]

**2** A farmer supplies cucumbers to a supermarket.

The farmer grew 7882 cucumbers last year.

The supermarket bought 59% of these cucumbers.

**(a)** **Estimate** the number of cucumbers the supermarket bought.

Show your working.

$7882 \approx 8000, \quad 59\% \approx 60\% = 0.6$

$8000 \times 0.6 = 4800$

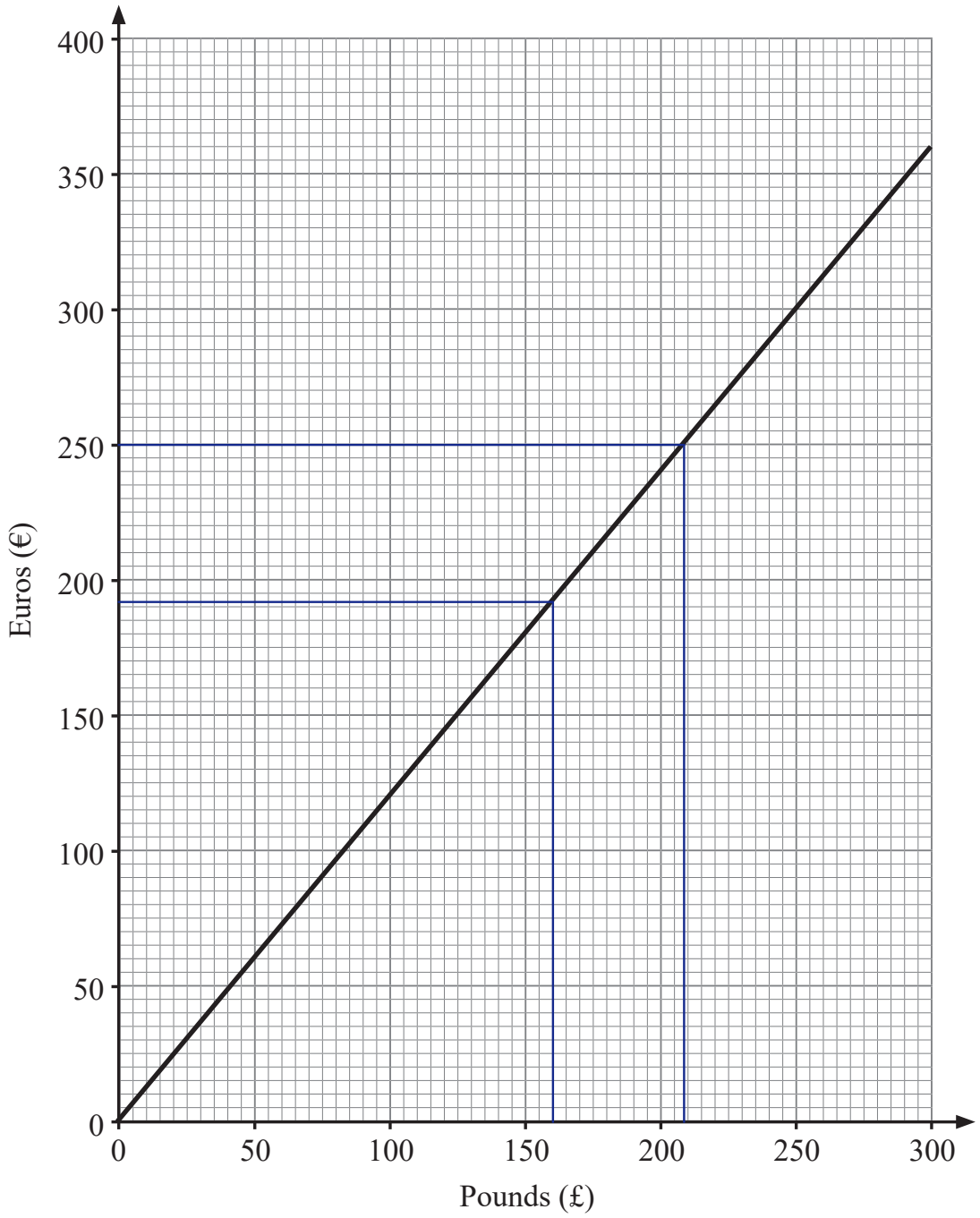
Answer 4800 [2]

**(b)** Explain why your answer to **(a)** is an overestimate.

Answer both 7882 and 59% were rounded up, so the estimate is bigger than the real number [1]

**[Turn over**

**3** This is a conversion graph to change between pounds (£) and euros (€).




14119


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**(a)** Orla changes 250 euros (€) into pounds (£).

How many pounds (£) does she get?

Answer £ 208 [1]

**(b)** Callum has £160 and €200

Quinn Electronics lets him spend both pounds and euros.

Can Callum afford to buy a laptop costing €385?

**Show your working.**

From the graph: £160 = €192

Total in euros: €192 + €200 = €392

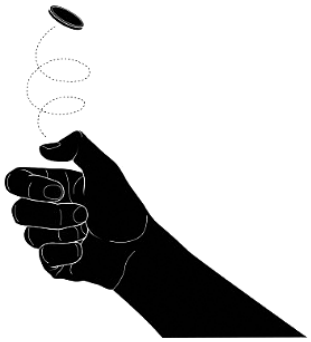
€392 > €385

Answer Yes because €392 is more than €385 [2]

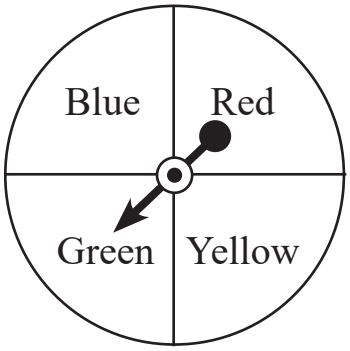
**[Turn over**

**4** Bill flips a fair coin with outcomes head and tail once.

He spins the spinner with outcomes blue, red, yellow and green once.



© Getty Images




**(a)** List all the possible outcomes that Bill can get.

*Head Blue, Head Red, Head Yellow, Head Green*

*Tail Blue, Tail Red, Tail Yellow, Tail Green*

[2]

**(b)** The probability of getting an outcome of a tail and yellow is $\frac{1}{8}$

Explain **clearly** why this is the case.

*There are 2 × 4 = 8 equally likely outcomes.*

*Only one of them is Tail Yellow,*

*so P(Tail Yellow) = $\frac{1}{8}$*

[1]

**5** The length of the side of a square is 51.1 cm.

**Estimate** the area of the square.

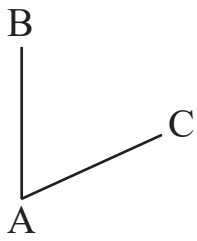
$51.1 \approx 50$

$\text{Area} \approx 50 \times 50 = 2500$

Answer 2500 $cm^2$ [2]

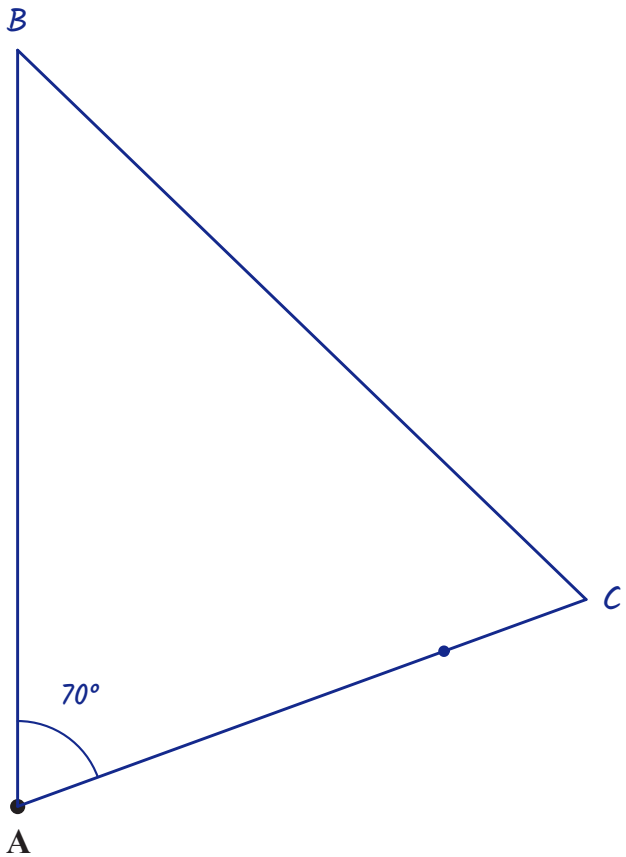
**[Turn over**

**6** Cara read the following instructions to draw a triangle.



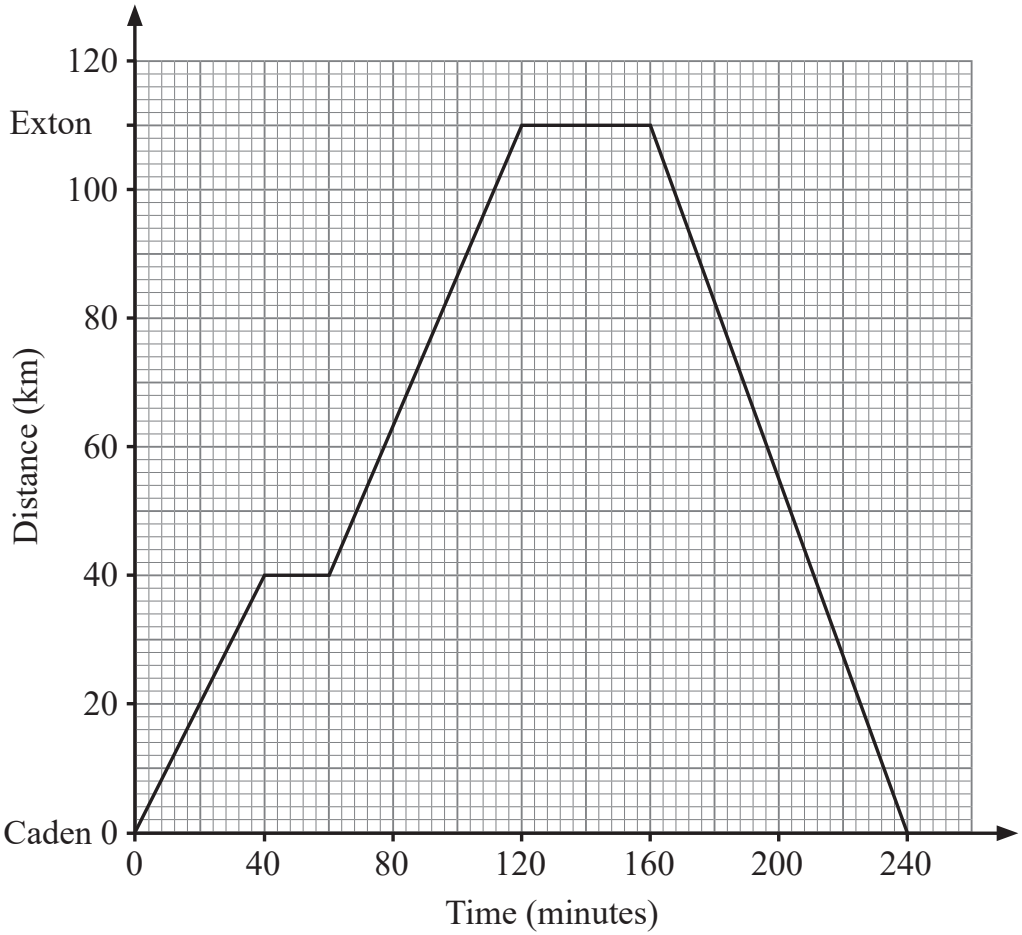

- Using a ruler, draw a 10 cm **vertical line** from point A.
  **Note: Point A has been marked below**.
- Label the other end B.
- Place a protractor at point A and measure an angle of 70° to the right of the line AB and mark with a dot.
- Draw an 8 cm line from A through your dot.
- Label the end of this line C.
- Join B to C.

Follow the instructions and draw Cara's triangle below.




[3]

7 The graph shows Paul's journey from Caden to Exton and back to Caden.




**(a)** How far is Paul from Caden when he first stops?

Answer 40 km [1]

**(b)** How long did Paul stay at Exton?

Answer 40 minutes [1]

**(c)** Paul left Caden at 8.30 am.

At what time did he leave Exton?

Leaves Exton at 160 min = 2 h 40 min
8.30 + 2 h 40 min = 11.10

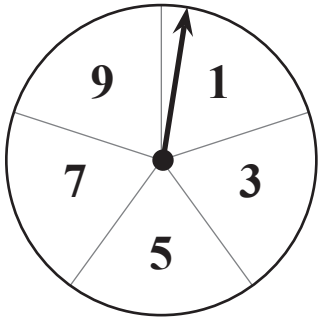
Answer 11.10 am [2]

**[Turn over**




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**8** A fair spinner has outcomes of 1, 3, 5, 7 and 9




The spinner is spun twice.

The two outcomes are **added** together to give a score.

**(a)** Complete the table below to show all possible scores.

**First spin**

| **Second spin** | + | 1 | 3 | 5 | 7 | 9 |
|---|---|---|---|---|---|---|
| | 1 | 2 | 4 | 6 | 8 | 10 |
| | 3 | 4 | 6 | 8 | 10 | 12 |
| | 5 | 6 | 8 | 10 | 12 | 14 |
| | 7 | 8 | 10 | 12 | 14 | 16 |
| | 9 | 10 | 12 | 14 | 16 | 18 |

[2]

**(b)** What is the probability of getting the "most likely" score?

10 is the most likely score: it appears 5 times out of 25 outcomes

Answer $\frac{5}{25}$ [1]

**9** A bag contains 140 g of crisps.

30% is fat.

How many grams is this?

10% of 140 = 14

30% = 14 × 3 = 42

Answer 42 g [2]

**[Turn over**

**10** Kevin owns a business.

$\frac{3}{5}$ of his customers pay by card.

$\frac{2}{7}$ pay in cash.

The rest pay by cheque.

What fraction pay by cheque?

$\frac{3}{5} + \frac{2}{7} = \frac{21}{35} + \frac{10}{35} = \frac{31}{35}$

$\frac{35}{35} - \frac{31}{35} = \frac{4}{35}$

Answer $\frac{4}{35}$ [3]

**11**



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Look at the table below.

It shows the number of pastries sold in the morning.

| | |
|---|---|
| **Cinnamon rolls** | **1** |
| **Apple pies** | **6** |
| **Chocolate muffins** | **8** |
| **Carrot cake** | **5** |

Based on this data, how many of the 50 pastries sold in the afternoon would you expect to be chocolate muffins?

Total in morning = 1 + 6 + 8 + 5 = 20

$P(\text{chocolate muffin}) = \frac{8}{20} = \frac{2}{5}$

$\frac{2}{5} \times 50 = 20$

Answer 20 [3]

**[Turn over**

**12** Given that $\frac{29400}{245} = 120$, **write down** the answer to

**(a)** $\frac{2940}{245}$

Answer 12 [1]

**(b)** $245 \times 240$

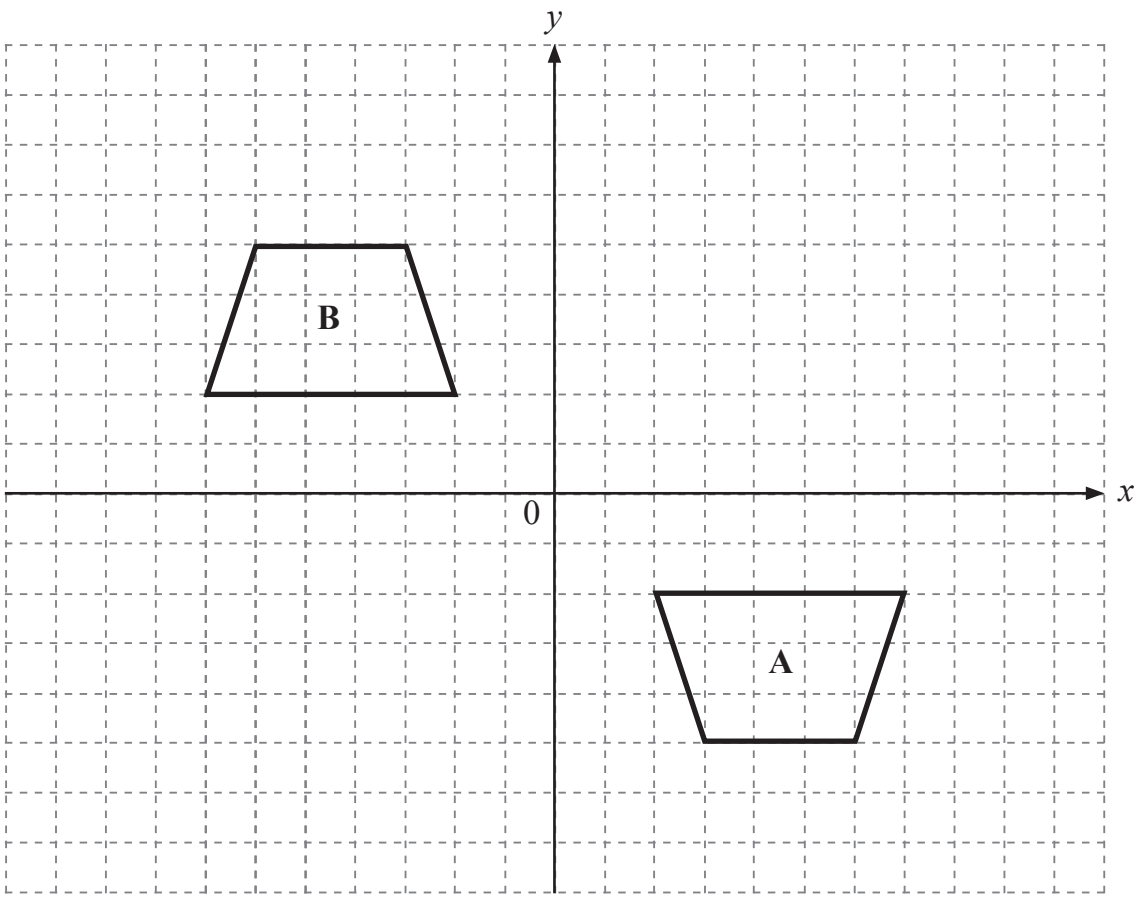
Answer 58 800 [1]

**(c)** $24.5 \times 1.2$

Answer 29.4 [1]

**13** The diagram shows two identical shapes, A and B.

Describe fully the single transformation which takes shape A to shape B.




Answer Rotation 180° about the origin (0, 0) [3]

**14** 110110 is a binary number.

20 is a decimal number.

Work out the total of the two numbers.

Give your answer as a binary number.

110110 = 32 + 16 + 4 + 2 = 54

54 + 20 = 74

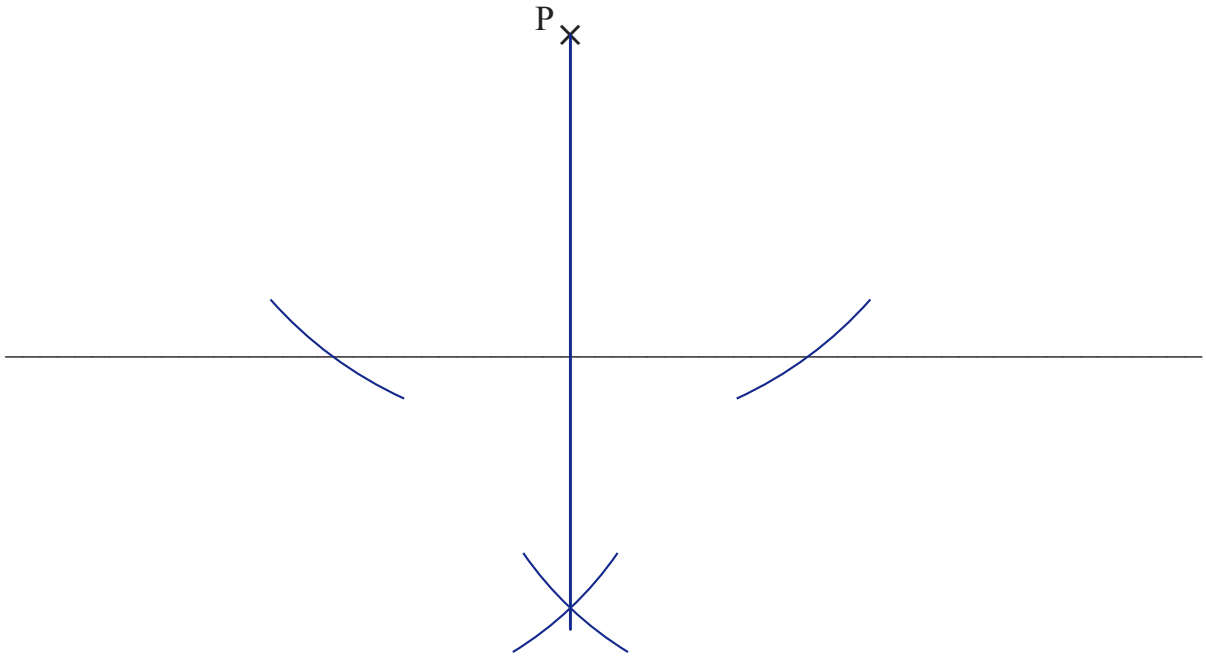
74 = 64 + 8 + 2

| 64 | 32 | 16 | 8 | 4 | 2 | 1 |
|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 1 | 0 | 1 | 0 |

Answer 1001010 [3]

**15** **Use a ruler and compasses** to construct the perpendicular from the point P to the line shown.

**Leave all construction arcs and lines**.




[2]

**[Turn over**




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**16** 7, 10, 13, 16, ...

Using the *n*th term, find the smallest term in the sequence above which is bigger than 1000

Show your working.

Difference = 3, so nth term = 3n + 4

3n + 4 > 1000

3n > 996

n > 332, so n = 333

3 × 333 + 4 = 999 + 4 = 1003

Answer 1003 [5]

**17**



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September 1st is on a Sunday.

Nina has applied to do her driving test in September.

No test dates are given on a Sunday.

Nina is unable to do her test on Mondays or Fridays due to work.

What is the probability that Nina is given a test date that **she cannot** do?

*September has 30 days. Sundays: 1, 8, 15, 22, 29 (5 days)*

*Possible test dates = 30 − 5 = 25*

*Mondays: 2, 9, 16, 23, 30 (5)  Fridays: 6, 13, 20, 27 (4)*

*Dates she cannot do = 5 + 4 = 9*

*P(date she cannot do) = $\frac{9}{25}$*

Answer *$\frac{9}{25}$* [3]





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## THIS IS THE END OF THE QUESTION PAPER

**DO NOT WRITE ON THIS PAGE**

| For Examiner's use only | |
|---|---|
| **Question Number** | **Marks** |
| 1 | |
| 2 | |
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| 17 | |
| **Total Marks** | |

**Examiner Number**

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