

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20	
TOTAL	



General Certificate of Secondary Education
Foundation Tier
June 2010

Mathematics (Modular) (Specification B) Module 5

43055/2F

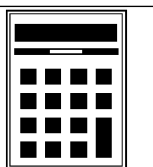
F

Paper 2 Calculator

Friday 11 June 2010 9.00 am to 10.15 am

For this paper you must have:

- a calculator
- mathematical instruments.



Time allowed

- 1 hour 15 minutes

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- 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.
- Do all rough work in this book. Cross through any work you do not want to be marked.
- If your calculator does not have a π button, take the value of π to be 3.14 unless another value is given in the question.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 70.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.

Advice

- In all calculations, show clearly how you work out your answer.



J U N 1 0 4 3 0 5 5 2 F 0 1

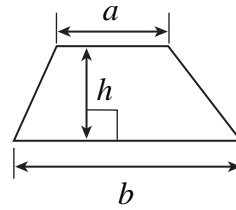
WMP/Jun10/43055/2F

43055/2F

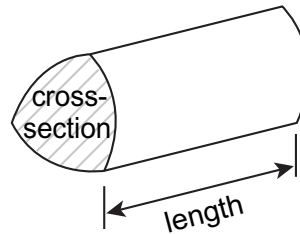
Formulae Sheet: Foundation Tier

You may need to use the following formulae:

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



Volume of prism = area of cross-section \times length



Answer **all** questions in the spaces provided.

1 (a) Tick a box to show whether each statement is true or false.

TRUE FALSE

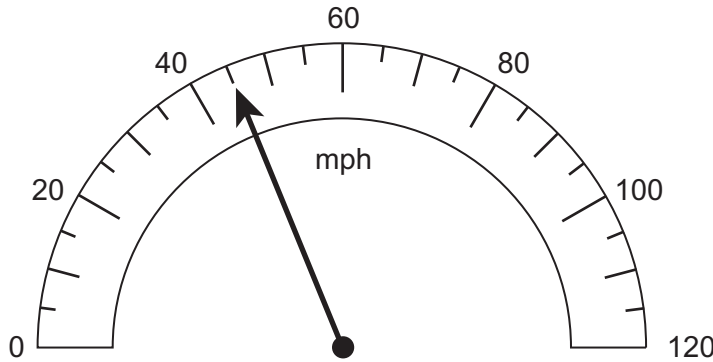
A mobile phone weighs about 100 kilograms.

A swimming pool contains about 500 millilitres of water when full.

One millimetre is longer than one centimetre.

(3 marks)

1 (b) The speedometer shows the speed of a car in miles per hour.



The speed limit is 60 miles per hour.

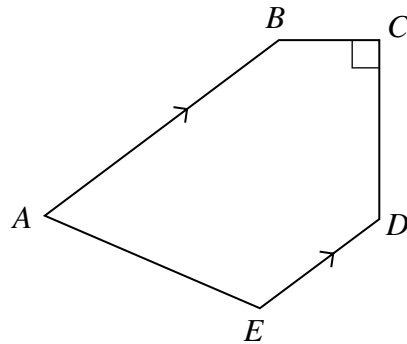
How many miles per hour slower than the speed limit is the car travelling?

.....
.....

Answer mph (2 marks)



2 (a) The diagram shows a shape $ABCDE$.



2 (a) (i) Which angle is an acute angle?

Answer (1 mark)

2 (a) (ii) Name an obtuse angle.

Answer (1 mark)

2 (a) (iii) Which line is parallel to AB ?

Answer (1 mark)

2 (a) (iv) Which line is perpendicular to CD ?

Answer (1 mark)



2 (b) (i) Use compasses to draw a circle, centre O , radius 6 centimetres.

$\times O$

(1 mark)

2 (b) (ii) What is the diameter of the circle?

Answer

cm

(1 mark)

2 (b) (iii) Draw a tangent to the circle.

(1 mark)

7

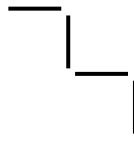
Turn over ►



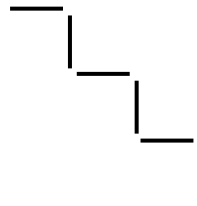
3 These patterns are made of sticks.



Pattern 1



Pattern 2



Pattern 3

3 (a) Draw Pattern 4.

(1 mark)

3 (b) How many sticks will there be in Pattern 10?

.....

Answer (1 mark)

3 (c) Which pattern will use 46 sticks?

.....

Answer (1 mark)

3 (d) Explain why there will **not** be a pattern that uses 101 sticks.

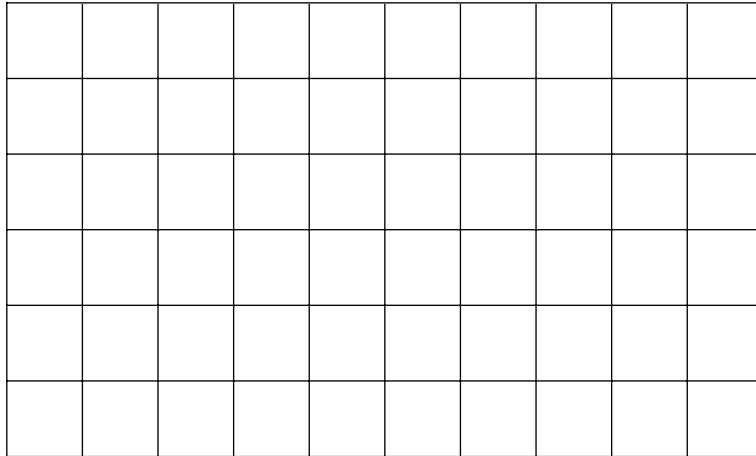
.....

.....

(1 mark)

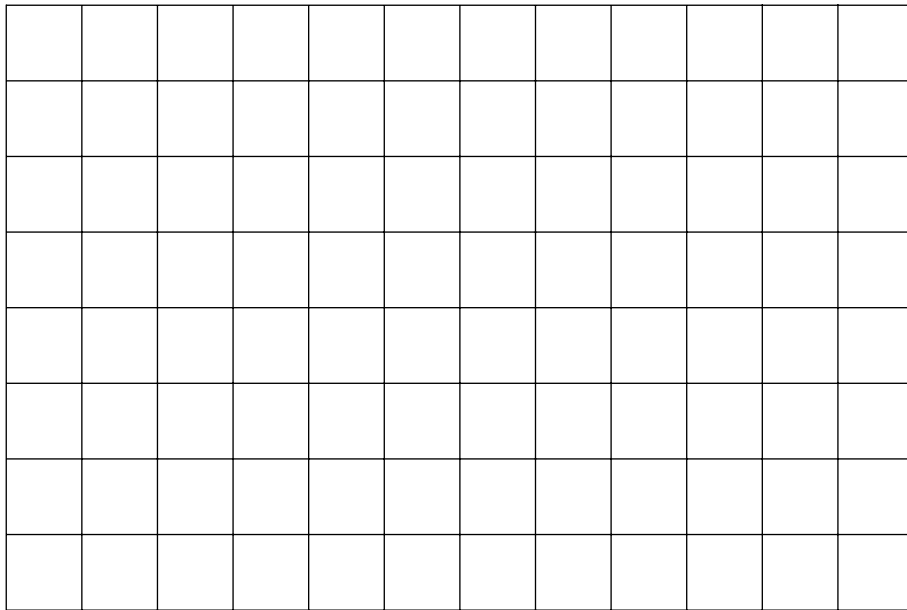


- 4 (a) On the centimetre grid, draw a square with perimeter 12 cm.



(2 marks)

- 4 (b) On this centimetre grid, draw a rectangle with area 12 cm^2 .



(2 marks)



5 Pete is a plumber.

He works out the charge (£), for each job using this formula.

$\text{Charge} = 20 \times \text{Number of hours worked} + 40$
--

5 (a) A job takes five hours.

How much does Pete charge?

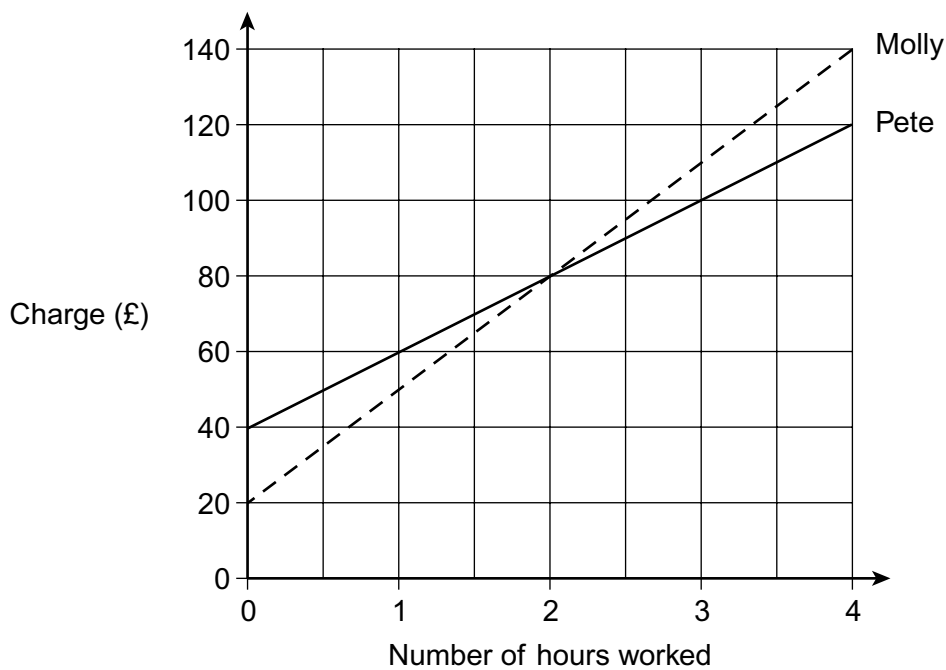
.....

.....

Answer £ (2 marks)

5 (b) Molly is also a plumber.

The graph shows the charge for jobs by each plumber.



5 (b) (i) How much does Molly charge for a job that takes 4 hours?

Answer £ (1 mark)



5 (b) (ii) A plumbing job is estimated to take between 1 hour and $2\frac{1}{2}$ hours.

Which plumber, Molly or Pete, would you choose?

Use the graph to give reasons for your answer.

Plumber

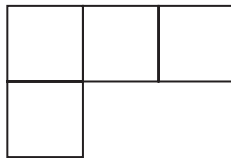
Reasons

.....

.....

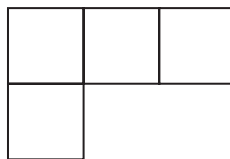
(2 marks)

6 This shape is made from squares.



One square is added to give the shape one line of symmetry.

Show **two** different ways that this can be done.



(2 marks)



7 (a) Here are some fractions.

$$\frac{2}{5} \quad \frac{3}{12} \quad \frac{4}{8} \quad \frac{5}{20} \quad \frac{6}{30}$$

Which **two** fractions are equivalent to $\frac{1}{4}$?

.....
.....
.....
.....

Answer and (2 marks)

7 (b) Write down any fraction that is less than $\frac{1}{4}$.

Answer (1 mark)

7 (c) Calculate the square root of 0.25

Answer (1 mark)

7 (d) Choose the correct word from this list to complete the sentence.

opposite reciprocal product square prime

$\frac{1}{4}$ is the of 4. (1 mark)



8 (a) Simplify $4a + 2b + a + 2b$

.....
.....

Answer (2 marks)

8 (b) Simplify $\frac{12x}{3}$

Answer (1 mark)

8 (c) Simplify $2c \times 3c \times 4d$

Answer (2 marks)

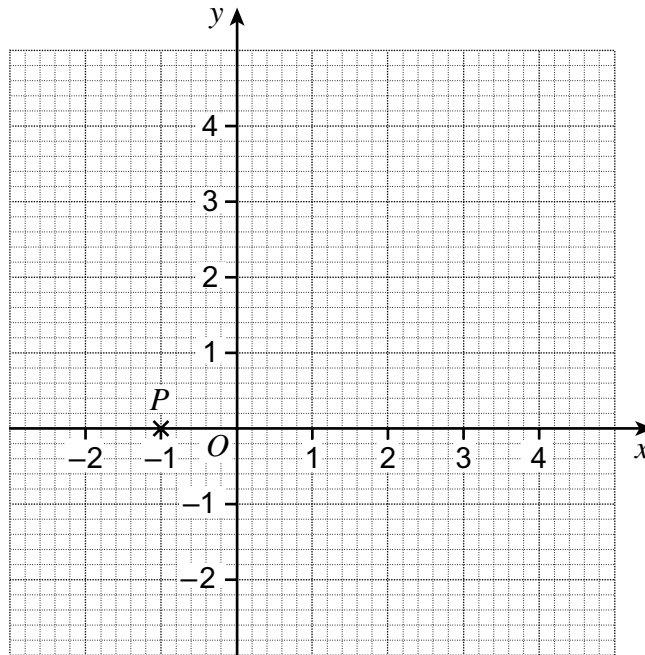
9 Complete the table to show some properties of quadrilaterals.
The first one has been done for you.

	Both pairs of opposite angles equal	Diagonals equal in length	Rotational symmetry of order 2
Parallelogram	✓	✗	✓
Square			
Rhombus			
Kite			

(3 marks)



- 10** Point P is shown on the grid.



- 10 (a) (i)** Write down the coordinates of P .

Answer (..... ,)

(1 mark)

- 10 (a) (ii)** Plot the point $(3, -1)$ on the grid.
Label it Q .

(1 mark)

- 10 (b) (i)** Draw the line $x = -2$ on the grid.

(1 mark)

- 10 (b) (ii)** Draw the line $y = 4$ on the grid.

(1 mark)



11 (a) Work out the value of $\frac{e}{6}$ when $e = 96$

.....

Answer (1 mark)

11 (b) This formula is used to work out the number of nails, N , needed to build a fence that has P panels.

$$N = 4P$$

Kim's fence has eight panels.
Ian's fence has more than eight panels.
Ian uses 24 more nails than Kim.

How many panels does Ian's fence have?
You **must** show your working.

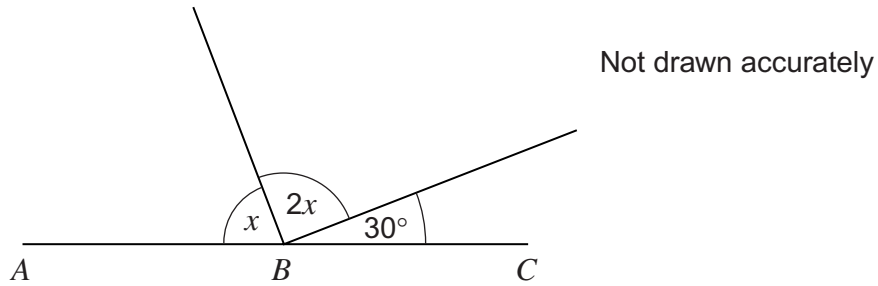
.....
.....
.....
.....

Answer (3 marks)

Turn over for the next question



- 12 (a) ABC is a straight line.
Josh says that all three angles in this diagram are acute.



Show that Josh is **not** correct.

.....

.....

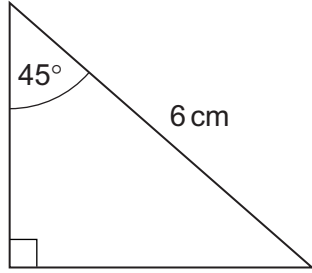
.....

.....

(3 marks)



12 (b) Here is a triangle.



Not drawn accurately

12 (b) (i) Explain why this triangle is isosceles.

.....

.....

.....

.....

(2 marks)

12 (b) (ii) Show how two of these triangles can be used to make another isosceles triangle.

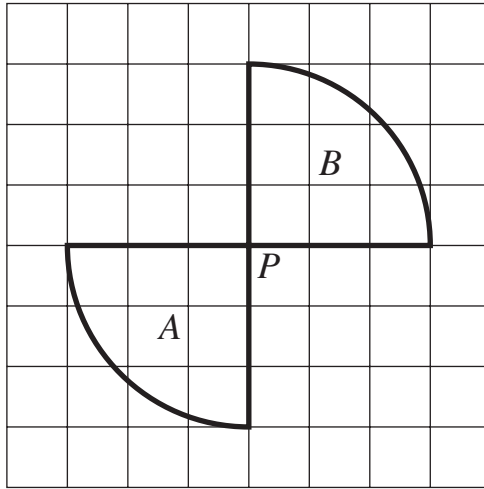
(1 mark)

6

Turn over ►



13 (a) Shape *A* and shape *B* touch at point *P*.



A single transformation will take shape *A* to shape *B*.

13 (a) (i) Sergio says the single transformation is a rotation.

Describe the rotation fully.

.....

(2 marks)

13 (a) (ii) Ranvir says the single transformation is a reflection.

Draw the mirror line for the reflection on the grid.

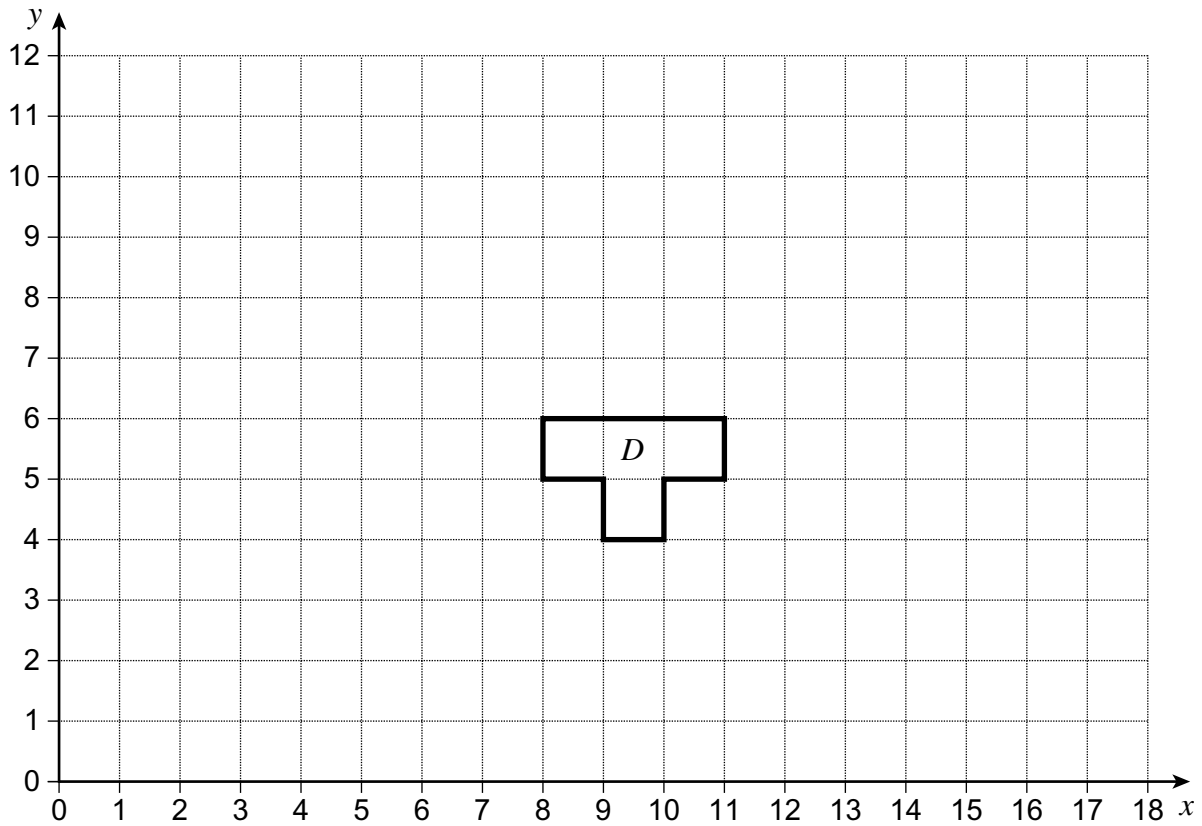
(1 mark)



- 13 (b) Shape C is **not** shown on the grid.
Shape D is a translation of shape C .

The translation vector from shape C to shape D is $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$

Draw shape C on the grid.

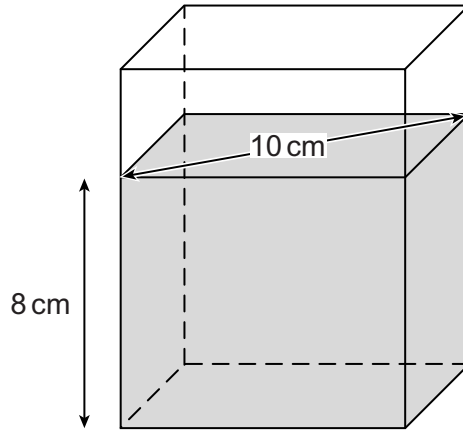


(2 marks)

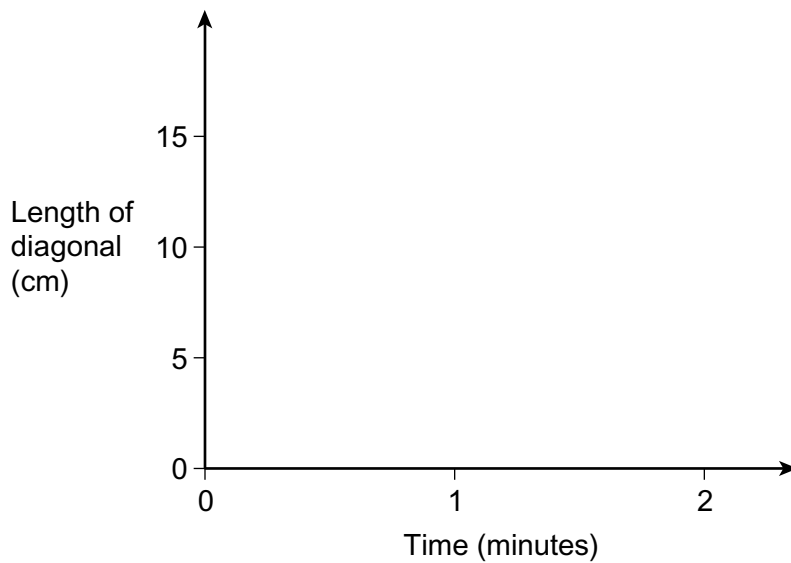
Turn over for the next question



- 14** A rectangular tank contains water.
The height of the water is 8 cm.
The length of the diagonal of the surface of the water is 10 cm.
Water is leaking from the tank at a steady rate.
The tank is empty after 2 minutes.



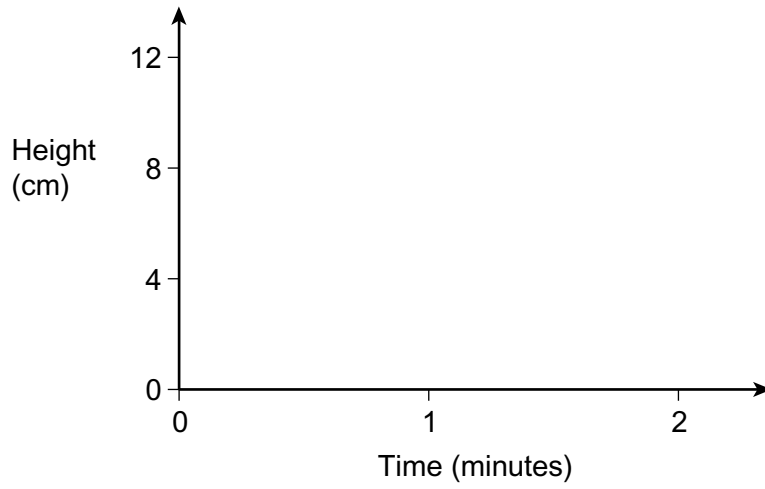
- 14 (a)** Sketch the graph of the length of the diagonal against the time.



(1 mark)

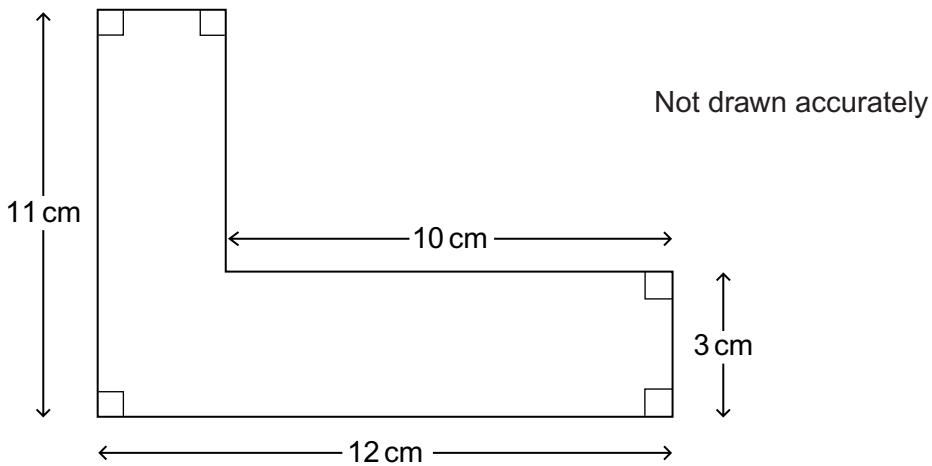


14 (b) Sketch the graph of the height against the time.



(1 mark)

15 Calculate the area of the shape.



.....

.....

.....

.....

.....

Answer cm² (3 marks)

Turn over for the next question

Turn over ►



16 (a) Show that $4(2p + 1) + 3(2 - p) = 5(p + 2)$

.....
.....
.....

(2 marks)

16 (b) Solve $6m - 5 > 0$

.....
.....

Answer (2 marks)

17 Mel is working out the volume of a shape in cm^3 .
She has correctly written down

$$\text{Volume} = \frac{2}{3} \times \pi \times 6^3 + \frac{1}{3} \times \pi \times 6^2 \times 10$$

Work out this volume.
Give your answer to one decimal place.

.....
.....

Answer cm^3 (2 marks)

END OF QUESTIONS

