

GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS SYLLABUS A
Paper 1 (Foundation Tier)

J512/01

Candidates answer on the Question Paper

OCR Supplied Materials:
None

Other Materials Required:

- Geometrical instruments
- Tracing paper (optional)

Monday 7 June 2010
Afternoon

Duration: 2 hours



| | | | |
|--------------------|--|-------------------|--|
| Candidate Forename | | Candidate Surname | |
|--------------------|--|-------------------|--|

| | | | | | | | | | | |
|---------------|--|--|--|--|--|------------------|--|--|--|--|
| Centre Number | | | | | | Candidate Number | | | | |
|---------------|--|--|--|--|--|------------------|--|--|--|--|

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your Candidate Number, Centre Number and question number(s).

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **100**.
- This document consists of **20** pages. Any blank pages are indicated.

WARNING



No calculator can be used for this paper

Formulae Sheet: Foundation Tier

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


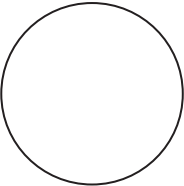
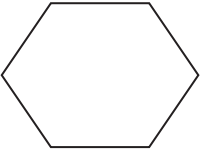


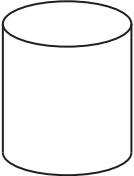


Volume of prism = (area of cross-section) \times length



PLEASE DO NOT WRITE ON THIS PAGE

- 1 Put a ring round the mathematical name for each shape.
The first one has been done for you.

| | |
|--|--|
|  | <p>Kite <u>Rectangle</u> Octagon Circle</p> |
| <p>(a)</p>  | <p>Quadrilateral Rectangle Octagon Circle</p> |
| <p>(b)</p>  | <p>Quadrilateral Hexagon Octagon Circle</p> |
| <p>(c)</p>  | <p>Pentagon Hexagon Rhombus Triangle</p> |
| <p>(d)</p>  | <p>Arrowhead Parallelogram Octagon Trapezium</p> |
| <p>(e)</p>  | <p>Cylinder Cone Sphere Cuboid</p> |

[5]

- 2 (a) Write these numbers in order, smallest first.

12 000 100 000 2389 25 490

.....
 _____ [1]
smallest

- (b) Complete this sum.

$$43 + \underline{\hspace{2cm}} = 100 \quad [1]$$

- (c) (i) In 2008 the average cost of a house was two hundred and eighteen thousand, one hundred and twelve pounds.

Write two hundred and eighteen thousand, one hundred and twelve in figures.

(c)(i) _____ [1]

- (ii) In 2008 the average cost of a terraced house was £173 858.

Write 173 858 correct to the nearest hundred.

(ii) _____ [1]

- (iii) In 1967 the average cost of a house was £4077.

Write 4077 in words.

_____ [1]

- 3** A number is written on each face of a six-sided dice. Five different numbers are used and one of these numbers appears twice. Ravneet rolls the dice 30 times and records the results.

| | | | | | |
|---|---|---|---|---|---|
| 6 | 0 | 6 | 0 | 6 | 0 |
| 6 | 7 | 3 | 6 | 4 | 6 |
| 4 | 3 | 0 | 6 | 6 | 7 |
| 6 | 0 | 4 | 6 | 3 | 3 |
| 7 | 7 | 0 | 6 | 0 | 4 |

- (a)** Complete this frequency table to show her results.

| Result | Tally | Frequency |
|--------|-------|-----------|
| 0 | | |
| 3 | | |
| 4 | | |
| 6 | | |
| 7 | | |

[2]

- (b)** What is the mode of her results?

(b) _____ **[1]**

- (c)** Which number probably appears twice on her dice?

(c) _____ **[1]**

- 4 (a) Write down three **even** numbers between 1 and 10.

(a) _____ [1]

- (b) Complete these statements using the words 'odd' or 'even'.
The first one has been done for you.

even + even = even

odd + odd = _____

odd × even = _____

odd × odd = _____ [3]

- (c) (i) Find the sum of the first 3 odd numbers, $1 + 3 + 5$.

.....
(c)(i) _____ [1]

- (ii) Find the sum of the first 5 odd numbers.

.....
(ii) _____ [1]

- (iii) Find the square root of the sum of the first 9 odd numbers.

.....
.....
.....
(iii) _____ [2]

5 Write

(a) 50% as a fraction,

(a) _____ [1]

(b) $\frac{3}{4}$ as a decimal,

(b) _____ [1]

(c) 0.25 as a percentage,

(c) _____ % [1]

(d) 0.12 as a fraction in its lowest terms.

.....

(d) _____ [2]

- 6 Ticket prices at the zoo are £6.50 for an adult and £4.50 for a child.
 A family ticket costs £18 and can be used for up to two adults and up to four children.
 Mr and Mrs Wheat and their three children go to the zoo.

How much cheaper is it to buy a family ticket instead of separate adult and child tickets?

.....

£ _____ [4]

- 7 This is the breakfast menu in a small hotel.

| <u>Breakfast</u> | |
|----------------------|--|
| Choose one from | orange juice (o) apple juice (a) fresh fruit (f) |
| Followed by one from | cereal (c) scrambled eggs (s) kippers (k) |

- (a) Complete the table to show all the different choices that can be made by people who choose two items from the menu.
The first one has been done for you.
You may not need all the lines.

| o | c |
|---|---|
| | |
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| | |

[2]

- (b) Adam chooses his breakfast at random from this menu.

What is the probability he chooses apple juice and kippers?

.....
 (b) _____ [1]

- (c) The new chef looks at the menu and prepares the same number of servings of cereal, scrambled eggs and kippers.

Why might this **not** be a sensible decision?

 _____ [1]

- 8 (a) Simplify.

(i) $e + 7e$ (a)(i) _____ [1]

(ii) $2c + 8d + 3c - 6d$

 (ii) _____ [2]

(iii) $g \times g \times g \times g$
 (iii) _____ [1]

- (b) Solve.

(i) $9x = 45$

 (b)(i) _____ [1]

(ii) $\frac{y}{7} = 3$

 (ii) _____ [1]

- 9 Seth has a badge with his name written on it.



- (a) Draw the line of symmetry on this letter T.



[1]

- (b) One of the letters on the badge has more than one line of symmetry.

Copy this letter in the space below and draw all its lines of symmetry.

[2]

- (c) Write down a letter that has rotational symmetry of order 2.

(c) _____ [1]

10 Work out.

(a) 9^2

(a) _____ [1]

(b) $\sqrt{16}$

(b) _____ [1]

(c) $\frac{3}{8}$ of 40

.....
.....

(c) _____ [2]

(d) 30% of 70

.....
.....

(d) _____ [2]

(e) 72×24

You must show your working.

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

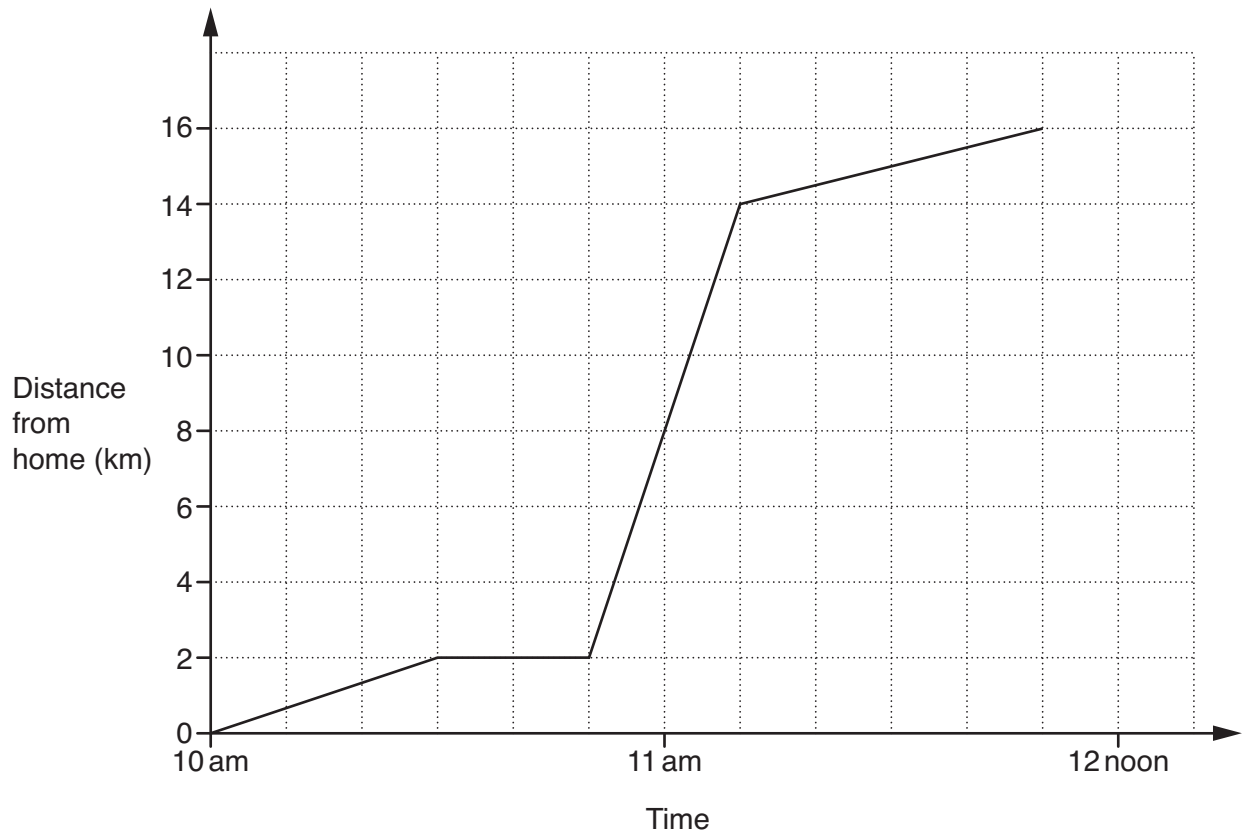
(e) _____ [3]

(f) $10^3 + 2^3$

.....
.....

(f) _____ [2]

- 11 Farrel travelled from his home to a country park. He walked to the station, took the train and finally walked to the park. This distance-time graph represents his journey.



- (a) Farrel walked the first 2 km.

How long did this take him?

(a) _____ minutes [1]

- (b) Mark with a cross (X) the section of the graph that represents Farrel waiting for his train. [1]

(c) (i) How far did Farrel travel by train?

(c)(i) _____ km [1]

(ii) Calculate the average speed of the train journey in kilometres per hour.

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

(ii) _____ km/h [2]

(d) Farrel thinks he walked more slowly at the end of his journey than at the beginning.

How can you tell that he is correct?

_____ [1]

12 This stem and leaf diagram shows the ages in years of all the teachers at a small school.

| | | | | | |
|---|---|---|---|---|---|
| 2 | 3 | 8 | | | |
| 3 | 0 | 2 | 4 | 5 | 5 |
| 4 | 1 | 3 | 4 | 8 | |
| 5 | 4 | 7 | 8 | | |
| 6 | 0 | 1 | | | |

Key: 3 | 0 represents 30 years

(a) How many teachers are there at the school?

(a) _____ [1]

(b) How old is the youngest teacher?

(b) _____ years [1]

(c) What is the range of the ages?

.....
 (c) _____ years [2]

(d) What is the median age?

.....
 (d) _____ years [2]

(e) At the end of term a teacher leaves and is replaced by a new teacher.
 The modal age goes down by 3 years.

What are the ages of the teacher who left and the new teacher?

.....

 (e) Teacher who left _____ years
 New teacher _____ years [3]

(f) Mr Hibley is 60 years old.
 The probability that Mr Hibley will retire this year is 0.83.

What is the probability that Mr Hibley will not retire this year?

.....
 (f) _____ [1]

13 (a) Explain why each answer is incorrect.

(i) $3.7 \times -4.5 = 16.65$

 [1]

(ii) $\sqrt{67.24} = 7.2$

 [1]

(iii) $6.3 \div 0.9 = 70$

 [1]

(b) Work out.

(i) $(16 + 5) \div 3$

.....

.....

(b)(i) _____ [1]

(ii) $4 + 6 \times 3$

.....

.....

(ii) _____ [1]

(c) Put one pair of brackets into this equation to make it correct.

$$44 - 26 - 3 + 8 = 7$$

[1]

14 Work out the value of $x^2 + 5x$ when

(a) $x = -2$,

.....

(a) _____ [2]

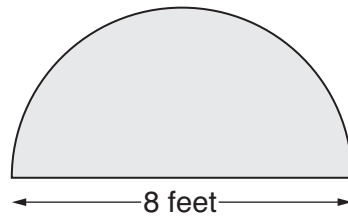
(b) $x = \frac{1}{2}$.

.....

(b) _____ [2]

15 In this question, take the value of π to be 3.

Emma visited a stately home.
 In one of the rooms there was a semi-circular carpet.
 The diameter of the carpet was 8 feet.

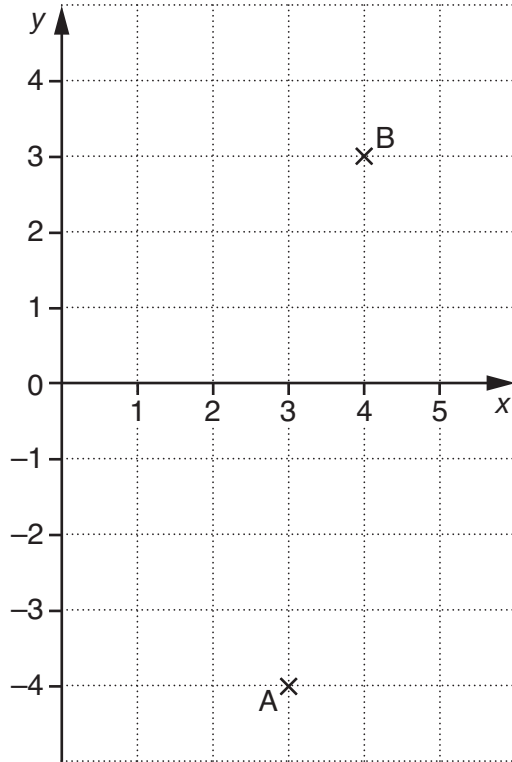


Work out the area of the carpet.
 Give the units of your answer.

.....

_____ [3]

16



(a) An anticlockwise rotation, centre $(0, 0)$, will map point A onto point B.

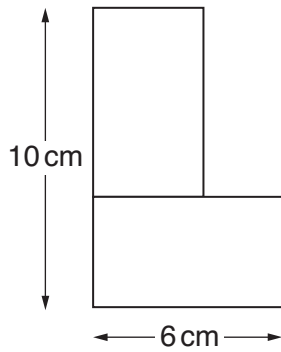
What is the angle of the rotation?

(a) _____ ° [1]

(b) Describe **fully** a different type of transformation which will map point A onto point B.

[3]

17 The diagram shows two **identical** rectangles joined to make an L shape.



NOT TO SCALE

Work out

(a) the total area of the L shape,

.....

.....

.....

.....

.....

.....

(a) _____ cm² [3]

(b) the perimeter of the L shape.

.....

.....

.....

.....

.....

.....

(b) _____ cm [3]

18 Use ruler and compasses only in this question.

Find and indicate clearly all possible points that are both

- 6 cm from A

and

- equidistant from B and C.



[5]

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