Oxford Cambridge and RSA

Monday 3 June 2024 – Morning

GCSE (9–1) Mathematics

J560/05 Paper 5 (Higher Tier)

Time allowed: 1 hour 30 minutes

You must have:
- the Formulae Sheet for Higher Tier (inside this document)

You can use:
- geometrical instruments
- tracing paper

Do not use:
- a calculator

H

* J 5 6 0 0 5 *

Please write clearly in black ink. **Do not write in the barcodes.**

Centre number

Candidate number

First name(s)

Last name

INSTRUCTIONS
- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. If you need extra space use the lined pages at the end of this booklet. The question numbers must be clearly shown.
- Answer **all** the questions.
- Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.

INFORMATION
- The total mark for this paper is **100**.
- The marks for each question are shown in brackets **[ ]**.
- This document has **20** pages.

ADVICE
- Read each question carefully before you start your answer.

3 **(a)** Ryan makes a journey of 200 miles from his home to the coast.

$\frac{1}{10}$ of the journey is on roads with a speed limit of 40 miles per hour.

40% of the journey is on roads with a speed limit of 50 miles per hour.

Ryan leaves home at 08 50 and does not exceed the speed limits on the journey.

Find the earliest time that Ryan could arrive at the coast.
You must show your working.

(a) ..... **[6]**

(b) Write down an assumption you have made when working out the answer to part **(a)**.

.....

..... **[1]**

15 Expand and simplify.

$(x + 3)(4x + 1)(x - 2)$

..... **[3]**

16 Two prisms, A and B, are mathematically similar.

The ratio of the volume of prism A to the volume of prism B is 8 : 27. The height of prism A is 6 cm.

Work out the height of prism B.

..... cm **[3]**

18 A sphere has radius x cm.
A cone has radius R cm and height $2R$ cm.

The volume of the sphere is equal to the volume of the cone.

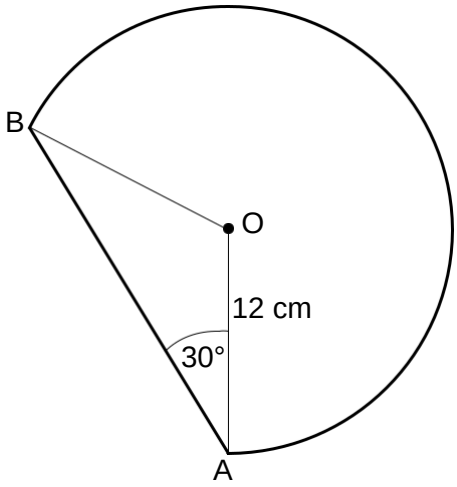
Write R in terms of x.

[The volume V of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.

The volume V of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]

..... **[4]**

20 The shape below is part of a circle, centre O and radius 12 cm. Angle OAB = 30°.

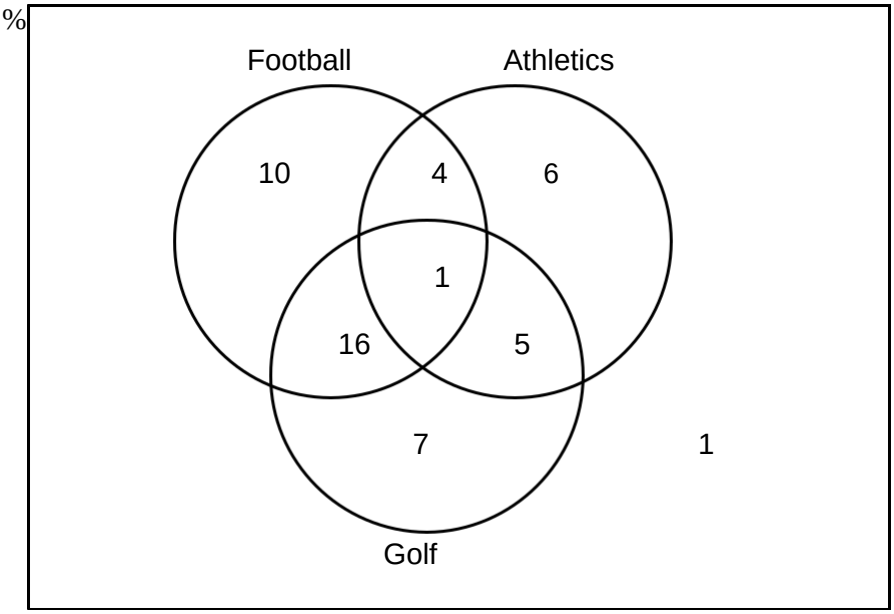


Not to scale

Work out the perimeter of the shape.
Give your answer in its simplest terms in the form $a\sqrt{b} + k\pi$.
You must show your working.

..... **[7]**

23 In a survey, 50 people are asked which sports they watch. The results are shown on the Venn diagram.



(a) One person is chosen at random from those that watch athletics.

Find the probability that this person watches **only one** other sport.

(a) ..... **[2]**

(b) Two of the 50 people are chosen at random.

Show that the probability that one of them watches **only** football and the other watches **only** golf is $\frac{2}{35}$. **[3]**

END OF QUESTION PAPER

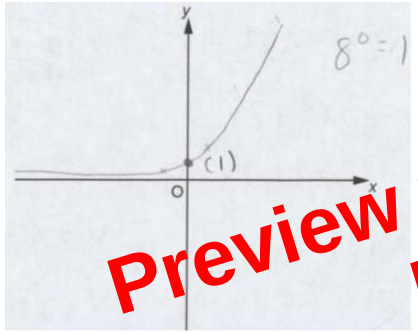
Question			Answer	Mark	Part marks and guidance	
12	(b)		[a =] 8000 [b =] 0.8	4	**B1** for [a =] 8000 AND **B3** for [b =] 0.8 oe or $\frac{4}{5}$ or $\frac{\text{their } a}{10000}$ oe 0.2 oe or **M1** for 6400 = $a \times b^{[1]}$ soi or better	Allow M2 for e.g. a = 0.8 M2 for e.g. 20% e.g. For M1 6400 = *their* $a \times b^{[1]}$ seen or 6400 = 8000× b [1] For M1 accept 8000 – 6400 = 8000b [1] seen
13			Both inequalities $x \geq 10$, $x \leq -10$ as final answer	3	 **B2** for answer one of $x \geq 10$ or $x \leq -10$ or **M1** for $x^2 \geq 100$ or for $(x + 10)(x - 10)$	Allow 3 marks for –10 x 10 final answer B2 implied by answer e.g. –10 x 10 or $x \geq \pm 10$ as one element of inequality correct M1 implied by 10 **or** –10 seen in answer

APPENDIX 2 Question 4d

	Response	Mark
1	It is extrapolated and not in the data provided	**1**
2	The diagram has no data above 49 (underlined part gets the mark) (accept range 49 to 59 for this type of statement)	**1**
3	The graph does not go up to 60 as there is no data above 49 (underlined part gets the mark)	**1**
4	We do not know that the pattern will continue above 49 (implies trend may not continue)	**1**
5	The graph does not cover that data range (allow for the underlined part)	**1**
6	There are no pupils on the graph with scores above 49 (accept pupils oe for data) (accept range 49 to 59 for this type of statement)	**1**
7	There are no plots/points/results on the graph above 49 (accept plots/points/results for data) (accept range 49 to 59)	**1**
8	Most pupils scored between 20 and 50 in Science – we cannot predict accurately for 60 marks	**1**
9	They may be much better at one subject than the other and do not follow the correlation (allow for the underlined part with 'may')	**1**
10	There is no data above 50 [for Science] (accept range 49 to 59 for this type of statement)	**1**
11	It may be an outlier (Implies it may not follow the pattern)	**1**
12	It is too far away from the last piece of data	**1**
13	There is insufficient data (implies small sample)	**1**
14	The graph reaches up to 49 (not referring to data)	**0**
15	The scattergraph does not go beyond 50 (not referring to data)	**0**
16	Extrapolated (needs explanation)	**0**
17	The graph only goes up to 49 (not referring to data)	**0**
18	The graph does not show information for a score of 60	**0**
19	There is no data	**0**
20	They might be better at Maths than Science	**0**
21	It is an outlier (It is not an outlier – we do not know – needs to be phrased like example 11)	**0**
22	The highest Maths score was 49 and the highest Science score was 52 (Science is 49 and Maths 52 so incorrect)	**0**
23	Because there is no results	**0**

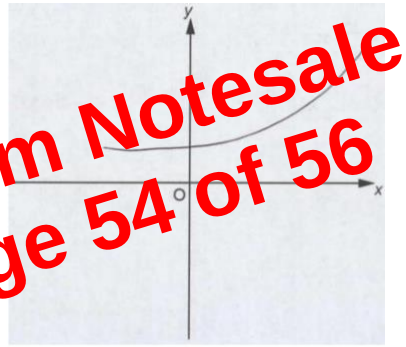
Additional guidance Question 22(a)

Example A



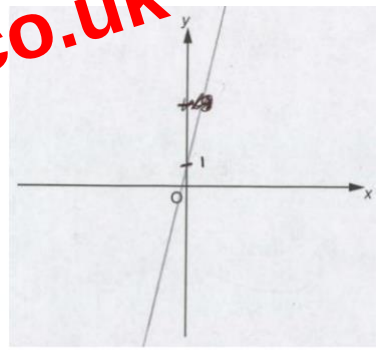
Correct shape, mark intention passes through $y = 1$
2 marks

Example B



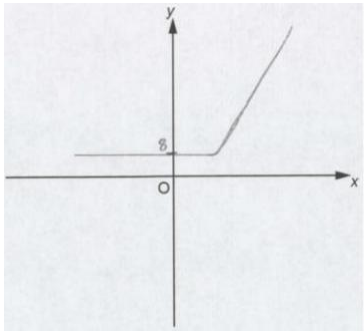
Correct shape **B1**

Example C



y – intercept at 1
B1

Example D



Ruled wrong shape **B0**