

Oxford Cambridge and RSA

Monday 10 June 2024 – Morning

GCSE (9–1) Mathematics

J560/06 Paper 6 (Higher Tier)

Time allowed: 1 hour 30 minutes

You must have:

- the Formulae Sheet for Higher Tier (inside this document)

You can use:

- a scientific or graphical calculator
- geometrical instruments
- tracing paper

H

+ . 7 5 6 0 0 6 +

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 a HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. You can use extra paper if you need to, but you must clearly show your candidate number, the centre number and the question numbers.
- 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.
- Use the π button on your calculator or take π to be 3.142 unless the question says something different.

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.

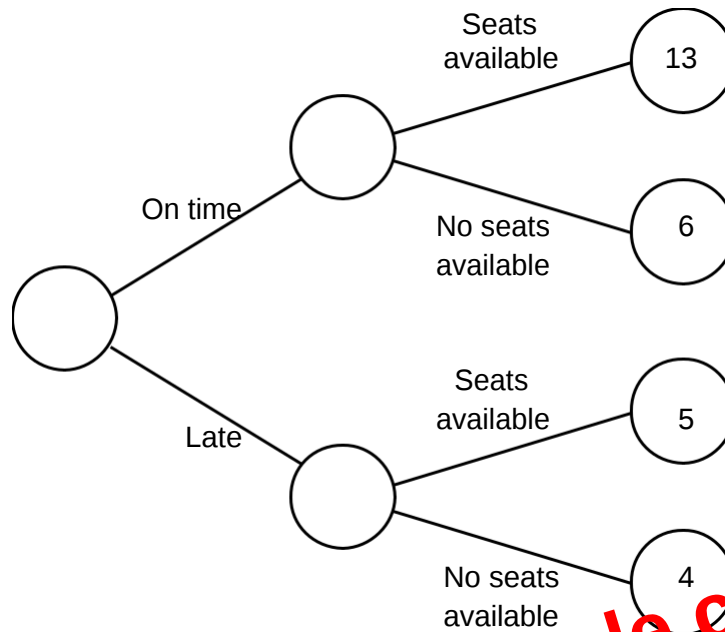
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11 Jack travels to work each day by train.

He records whether

- the train is on time or late
- there are seats available or no seats available.

Jack's results are shown on this partly completed frequency tree.



(a) Find the relative frequency of there being no seats available on Jack's train journey.

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(a) [2]

(b) Jack says

If the train is late, travellers are less likely to find seats available than if the train was on time.

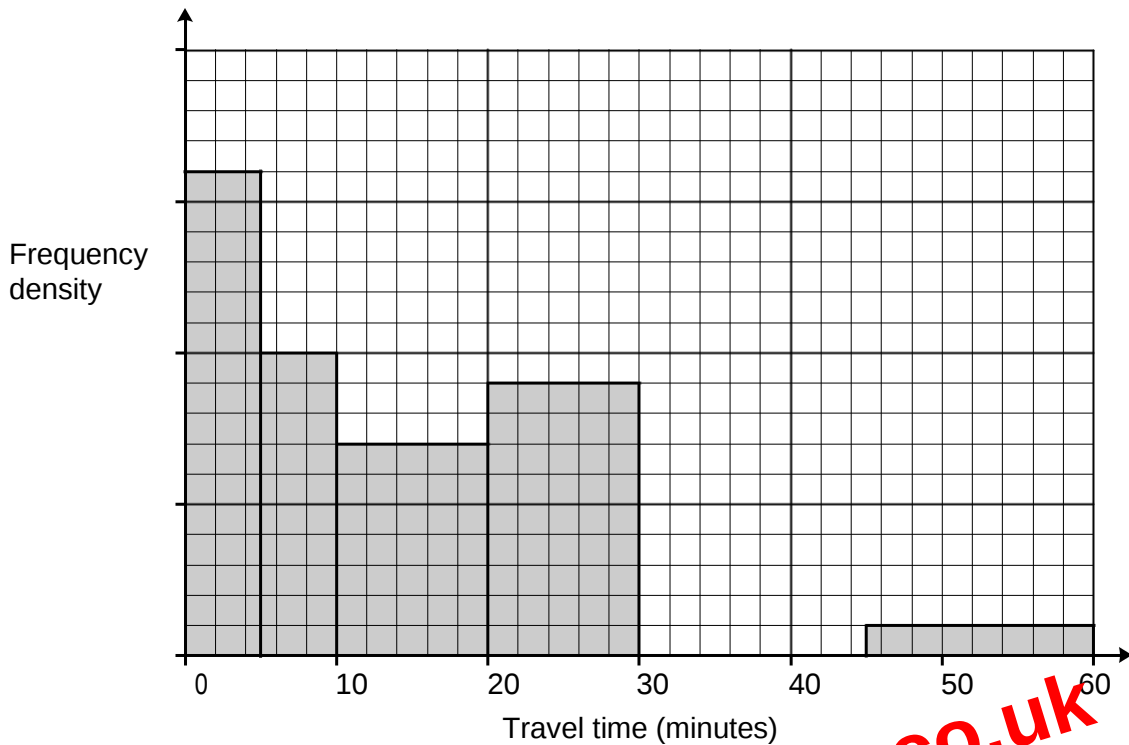
Does Jack's data suggest he is correct? Show how you decide.

..... because

.....

..... [3]

- 13** A group of students record the time taken to travel to school. All students in the group took less than an hour to travel to school. Some of their results are recorded on this histogram.



16 students took less than 5 minutes to travel to school.

- (a)** How many students took less than 40 minutes to travel to school?

(a) students [4]

- (b)** 9 students took between 30 and 45 minutes to travel to school.

Add these students' results to the histogram.

[2]

0 0

2

[3]

(b) Explain how $\frac{11}{11}^2 = 0.18^{00}$ can be used to find $\frac{10}{11}$ as a decimal and write down its value.

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10

11

= [2]

Subject-Specific Marking Instructions

12. **M** marks are for using a correct method and are not lost for purely numerical errors.
A marks are for an accurate answer and depend on preceding **M** (method) marks. Therefore **M0 A1** cannot be awarded.
B marks are independent of **M** (method) marks and are for a correct final answer, a partially correct answer, or a correct intermediate stage.
SC marks are for special cases that are worthy of some credit.
13. The following abbreviations are commonly found in GCSE Mathematics mark schemes.
- **figs 237** for example, means any answer with only these digits. You should ignore leading or trailing zeros and any decimal point e.g. 237000, 2.37, 2.370, 0.00237 would be acceptable but 23070 or 2374 would not.
 - **isw** means **ignore subsequent working** after correct answer obtained and applies as a default.
 - **nfww** means **not from wrong working**.
 - **oe** means **or equivalent**.
 - **rot** means **rounded or truncated**.
 - **soi** means **seen or implied**.
 - **dep** means that the marks are **dependent** on the marks indicated. You must check that the candidate has met all the criteria specified for the mark to be awarded.
 - **with correct working** means that full marks **must not** be awarded without some working. The required minimum amount of working will be defined in the guidance column and **SC** marks given for unsupported answers.
14. Anything in the mark scheme which is in square brackets [...] is not required for the mark to be earned, but if present it must be correct.
15. Unless the command word requires that working is shown and the working required is stated in the mark scheme, then if the correct answer is clearly given and is not from wrong working **full marks** should be awarded.

Do not award the marks if the answer was obtained from an incorrect method, i.e. incorrect working is seen and the correct answer clearly follows from it.

Question	Answer	Marks	Part marks and guidance
14	13.5 and 6.5 with correct working	5	'Correct working' requires evidence of Pythagoras or quadratic Accept $\frac{27}{2}$ and $\frac{13}{2}$ Allow other letters or $t - 10$ for h and allocate marks as per main method Accept -3.5 or ± 3.5 M2 for $[h^2 =] 12.5^2 - 12^2$ or better or M1 for $12^2 + h^2 = 12.5^2$ or better B1 for $h = 3.5$ AND M1 for $10 + \text{their } 3.5$ soi by 13.5 or $10 - \text{their } 3.5$ soi by 6.5 If 0, 1 or 2 scored, instead award SC3 for both 13.5 and 6.5 as answers with no or insufficient working If 0 or 1 scored, instead award SC2 for either 13.5 or 6.5 as answer with no working or insufficient working <u>Alternative method 1:</u> M3 for $t^2 - 20t + 87.75 = 0$ or M2 for $144 + t^2 - 20t + 100 = 156.25$ or M1 for $12^2 + (t - 10)^2 = 12.5^2$ AND M1 for correct method to solve <i>their</i> 3-term quadratic

Question	Answer	Marks	Part marks and guidance
18	17.5 to 17.6 with correct working	6	M2 for $\frac{20.3^2 + 6^2 - 2 \times 20.3 \times 6 \times \cos 55^\circ}{2 \times 20.3}$ or M1 for $\frac{20.3^2 + 6^2 - 2 \times 20.3 \times 6 \times \cos 55^\circ}{2 \times 20.3}$ oe A1 for 20.2 to 20.3 AND M2 for $\sqrt{20.3^2 + 6^2 - 2 \times 20.3 \times 6 \times \cos 55^\circ}$ or M1 for $20.3^2 + 6^2 - 2 \times 20.3 \times 6 \times \cos 55^\circ$ If 0, 1 or 2 scored, instead award SC3 for 17.5 to 17.6 with no working or insufficient working If 0 or 1 scored, instead award SC2 for 306.6 to 308.4 with no working or insufficient working If 0 scored, instead award SC1 for 20.2 to 20.3 with no working or insufficient working 'Correct working' requires evidence of at least M1M1 A1 implies M2 after M1 seen Their 20.3 or 20 from use of trig May be performed in stages

Question		Answer	Marks	Part marks and guidance
20		$\frac{1+10}{-3}$ final answer nfwv	5	$\frac{1+10}{-3}$ nfwv or M1 for $(x+7)(x-7)$ AND M2 for $4x-12+x-7$ or M1 for $4(x-3)+x-7$ <u>Alternative method:</u> M2 for $4(x^2+4x-21)$ or better or M1 for $4(x+7)(x-3)$ AND M2 for $(5x-19)(x+7)$ or M1 for $5x^2+16x-133$
				For M2 and M1 accept written as separate fractions $\frac{1+10}{-3} + \frac{7}{-3}$ e.g. M2 for $\frac{1+10}{-3}$

Bag Y is  C&NC.	0 NR 0	Insufficient compared with middle column of scheme. Ticked box mark is dependent on at least one other mark
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