

FSMQ

Additional Mathematics

6993/01: Additional Mathematics: Paper 1

Free Standing Mathematics Qualification

Mark Scheme for June 2025

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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MARKING INSTRUCTIONS**PREPARATION FOR MARKING
RM ASSESSOR**

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *RM Assessor Online Training: OCR Essential Guide to Marking*.
2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are available in RM Assessor.
3. Log-in to RM Assessor and mark the **required number** of practice responses (“scripts”) and the **required number** of standardisation responses.

MARKING

1. Mark strictly to the mark scheme.
2. Marks awarded must relate directly to the marking criteria.
3. The schedule of dates is very important. It is essential that you meet the RM Assessor 50% and 100% (traditional 40% Batch 1 and 100% Batch 2) deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.
4. If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone, email or via the RM Assessor messaging system.
5. **Crossed-Out Responses**
Where a candidate has crossed out a response and provided a clear alternative then the crossed-out response is not marked. Where no alternative response has been provided, examiners may give candidates the benefit of the doubt and mark the crossed-out response where legible.

Rubric Error Responses – Optional Questions

Where candidates have a choice of question across a whole paper or a whole section and have provided more answers than required, then all responses are marked and the highest mark allowable within the rubric is given. Enter a mark for each question answered into RM Assessor, which will select the highest mark from those awarded. *(The underlying assumption is that the candidate has penalised themselves by attempting more questions than necessary in the time allowed.)*

Multiple-Choice Question Responses

When a multiple-choice question has only a single, correct response and a candidate provides two responses (even if one of these responses is correct), then no mark should be awarded (as it is not possible to determine which was the first response selected by the candidate).

When a question requires candidates to select more than one option/multiple options, then local marking arrangements need to ensure consistency of approach.

Contradictory Responses

When a candidate provides contradictory responses, then no mark should be awarded, even if one of the answers is correct.

Short Answer Questions (requiring only a list by way of a response, usually worth only one mark per response)

Where candidates are required to provide a set number of short answer responses then only the set number of responses should be marked. The response space should be marked from left to right on each line and then line by line until the required number of responses have been considered. The remaining responses should not then be marked. Examiners will have to apply judgement as to whether a 'second response' on a line is a development of the 'first response', rather than a separate, discrete response. *(The underlying assumption is that the candidate is attempting to hedge their bets and therefore getting undue benefit rather than engaging with the question and giving the most relevant/correct responses.)*

Short Answer Questions (requiring a more developed response, worth two or more marks)

If the candidates are required to provide a description of, say, three items or factors and four items or factors are provided, then mark on a similar basis – that is downwards (as it is unlikely in this situation that a candidate will provide more than one response in each section of the response space).

Longer Answer Questions (requiring a developed response)

Where candidates have provided two (or more) responses to a medium or high tariff question which only required a single (developed) response and not crossed out the first response, then only the first response should be marked. Examiners will need to apply professional judgement as to whether the second (or a subsequent) response is a 'new start' or simply a poorly expressed continuation of the first response.

6. Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there, then add the annotation 'SEEN' to confirm that the work has been seen and mark any responses using the annotations in section 11.
7. There is a NR (**No Response**) option. Award NR (No Response):

- if there is nothing written at all in the answer space
- OR if there is a comment which does not in any way relate to the question (e.g., 'can't do', 'don't know')
- OR if there is a mark (e.g., a dash, a question mark) which is not an attempt at the question.

Note: Award 0 marks – for an attempt that earns no credit (including copying out the question).

8. The RM Assessor **comments box** is used by your Team Leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**
9. Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

10. Annotations and abbreviations

Annotation in RM Assessor	Meaning
BP	Blank Page – this annotation must be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.
✓ and ✕	
BOD	Benefit of doubt
FT	Follow through
ISW	Ignore subsequent working
M0, M1	Method mark awarded 0, 1
A0, A1	Accuracy mark awarded 0, 1
B0, B1	Independent mark awarded 0, 1
SC	Special case
^	Omission sign
MR	Misread
Other abbreviations in mark scheme	Meaning
AG	Answer given
DM1	M mark dependent on previous M mark (marked with a star)
cao	Correct answer only
oe	Or equivalent
soi	Seen or implied
www	Without wrong working
ft	Follow through. The mark is awarded if it is a result of starting with an incorrect value and there is no further error in working.
DR	This is to remind you that the question has the instruction “In this question you must show detailed reasoning”.
awrt	Answer which rounds to

11. **Marking Instructions**

- a** Annotations should be used whenever appropriate during your marking.

The A, M and B annotations must be used on your standardisation scripts for responses that are not awarded either 0 or full marks. It is vital that you annotate standardisation scripts fully to show how the marks have been awarded.

For subsequent marking you must make it clear how you have arrived at the mark you have awarded.

- b** An element of professional judgement is required in the marking of any written paper. Remember that the mark scheme is designed to assist in marking incorrect solutions. Correct *solutions* leading to correct answers are awarded full marks but work must not be judged on the answer alone, and answers that are given in the question, especially, must be validly obtained; key steps in the working must always be looked at and anything unfamiliar must be investigated thoroughly.

Correct but unfamiliar or unexpected methods are often signalled by a correct result following an *apparently* incorrect method. Such work must be carefully assessed. When a candidate adopts a method which does not correspond to the mark scheme, award marks according to the spirit of the basic scheme; if you are in any doubt whatsoever (especially if several marks or candidates are involved) you should contact your Team Leader.

- c** The following types of marks are available.

M

A suitable method has been selected and *applied* in a manner which shows that the method is essentially understood. Method marks are not usually lost for numerical errors, algebraic slips or errors in units. However, it is not usually sufficient for a candidate just to indicate an intention of using some method or just to quote a formula; the formula or idea must be applied to the specific problem in hand, eg by substituting the relevant quantities into the formula. In some cases the nature of the errors allowed for the award of an M mark may be specified.

A

Accuracy mark, awarded for a correct answer or intermediate step correctly obtained. Accuracy marks cannot be given unless the associated Method mark is earned (or implied). Therefore M0 A1 cannot ever be awarded.

B

Mark for a correct result or statement independent of Method marks.

- d** When a part of a question has two or more ‘method’ steps, the M marks are in principle independent unless the scheme specifically says otherwise; and similarly where there are several B marks allocated. (The notation ‘dep *’ is used to indicate that a particular mark is dependent on an earlier, asterisked, mark in the scheme.) Of course, in practice it may happen that when a candidate has once gone wrong in a part of a question, the work from there on is worthless so that no more marks can sensibly be given. On the other hand, when two or more steps are successfully run together by the candidate, the earlier marks are implied and full credit must be given.
- e** The abbreviation ft implies that the A or B mark indicated is allowed for work correctly following on from previously incorrect results. Otherwise, A and B marks are given for correct work only — differences in notation are of course permitted. A (accuracy) marks are not given for answers obtained from incorrect working. When A or B marks are awarded for work at an intermediate stage of a solution, there may be various alternatives that are equally acceptable. In such cases, exactly what is acceptable will be detailed in the mark scheme rationale. If this is not the case please consult your Team Leader.

Sometimes the answer to one part of a question is used in a later part of the same question. In this case, A marks will often be ‘follow through’. In such cases you must ensure that you refer back to the answer of the previous part question even if this is not shown within the image zone. You may find it easier to mark follow through questions candidate-by-candidate rather than question-by-question.

- f** Wrong or missing units in an answer should not lead to the loss of a mark unless the scheme specifically indicates otherwise. Candidates are expected to give numerical answers to an appropriate degree of accuracy, with 3 significant figures often being the norm. Small variations in the degree of accuracy to which an answer is given (e.g. 2 or 4 significant figures where 3 is expected) should not normally be penalised, while answers which are grossly over- or under-specified should normally result in the loss of a mark. The situation regarding any particular cases where the accuracy of the answer may be a marking issue should be detailed in the mark scheme rationale. If in doubt, contact your Team Leader.

- g** Rules for replaced work

If a candidate attempts a question more than once, and indicates which attempt he/she wishes to be marked, then examiners should do as the candidate requests.

If there are two or more attempts at a question which have not been crossed out, examiners should mark the better attempt and ignore the others.

NB Follow these maths-specific instructions rather than those in the assessor handbook.

- h** For a *genuine* misreading (of numbers or symbols) which is such that the object and the difficulty of the question remain unaltered, mark according to the scheme but following through from the candidate's data. A penalty is then applied; 1 mark is generally appropriate, though this may differ for some units. This is achieved by withholding one A mark in the question.

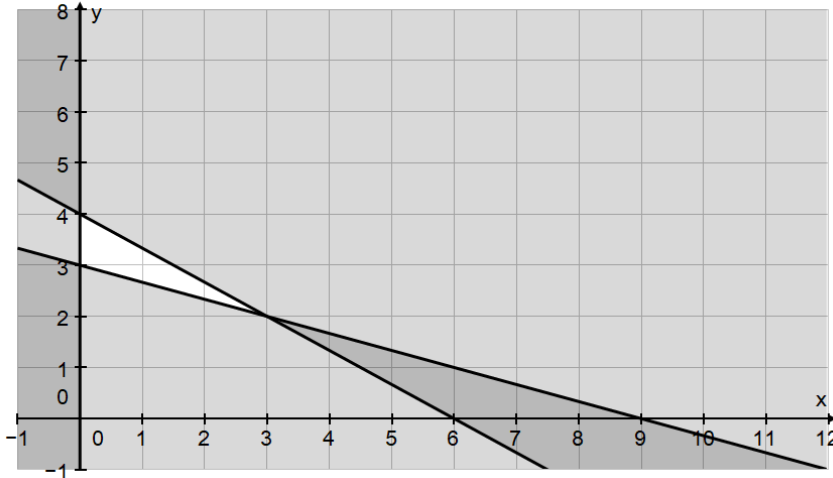
Note that a miscopy of the candidate's own working is not a misread but an accuracy error.

Question			Answer	Marks	Guidance
1			(-10) $\times 2^2(-)^3$ $= -1080 (x^3)$	B1 B1 B1	Sight of 10 Sight of correct powers Correct answer www B3 Ignore x^3
			Alternative method		
			$(4 - 12x + 9x^2)$ $(8 - 36x + 54x^2 - 27x^3)$ $(16 - 96x + 216x^2 - 216x^3 + 81x^4)$ $\Rightarrow -1080 (x^3)$	B1 B1 B1	Sight of correct quadratic Sight of correct cubic or quartic Answer identified (with no extra terms) (www)
				[3]	

Question			Answer	Marks	Guidance
2			DR		
			$7 < 3(x - 2) + 1 < 16$ $\Rightarrow 6 < 3x - 6 < 15$ $\Rightarrow 2 < x - 2 < 5$ $\Rightarrow 4 < x < 7$	M1 M1 A1	1 correct step (expanding bracket only is insufficient) Another correct step Steps can be in any order Can be in words
				[3]	

Question			Answer	Marks	Guidance
3			$(3 + \sqrt{2})^2 - (3 + \sqrt{2}) + 5$	B1	Correct expansion of the first term (possibly unsimplified)
			$= 9 + 6\sqrt{2} + 2 - 3 - \sqrt{2} + 5$	B1	Remaining terms correct
			$= 5\sqrt{2} + 13$	B1	SC Answer only scores B0 B0 B1 (ISW a decimal equivalent)
				[3]	

Question			Answer	Marks	Guidance
4			$\left(\frac{dy}{dx}\right) = 1 + 2x$	M1*	Differentiate (each power reduced by 1 and the coefficient changed)
			When $x = 1$, $\frac{dy}{dx} = 3$	DM1	Substitution of $x = 1$ into <i>their</i> derivative
			$\Rightarrow y - 6 = 3(x - 1)$	M1	Form equation for line
			$\Rightarrow y = 3x + 3$ oe	A1	Must be only 3 terms
				[4]	

Question			Answer	Marks	Guidance
5	(a)			B1 B1 B1 B1	1 oblique line Correct shading for this line. Other oblique line All shading correct, including $x \geq 0$ Allow an indication of the correct region (Includes identification by words or by shading)
				[4]	
	(b)	3		B1	
				[1]	

Question			Answer	Marks	Guidance
6	(a)		$s = \frac{t^3}{2} - \frac{t^4}{24}$ $\Rightarrow (v =) \frac{3t^2}{2} - \frac{t^3}{6}$ $\Rightarrow \left(\frac{dv}{dt} = a = \right) 3t - \frac{t^2}{2}$ $= 0 \text{ when } 3t = \frac{t^2}{2}$ $\Rightarrow t = 6$ $\Rightarrow v = 18(\text{ms}^{-1})$	M1 A1 M1 M1 A1 A1	Differentiate once (At least one power reduced by 1 and at least one coefficient changed, but beware dividing by t) For v Differentiate again Set <i>their</i> second differential = 0 For t . Ignore $t = 0$
				[6]	
	(b)		$v = 0$ when $t = 9$ after which the car would be moving backwards/in negative direction/in opposite direction	B1 B1	Or “stationary” (See exemplars at end of MS)
				[2]	

Question			Answer	Marks	Guidance
7	(a)		$^{10}C_4$	M1	Evidence of selection ($^{10}P_4$ is M0)
			= 210	A1	Mark final answer
				[2]	
	(b)	(i)	$^5C_4 + ^5C_4$	M1	Adding (or 2x) (5P_4 is M0) soi by sight of 10
			= 10	A1	Mark final answer
				[2]	
		(ii)	$^5C_2 \times ^5C_2$	M1	Multiplying 2 choices (only)
			= 100	A1	Mark final answer
				[2]	

Question		Answer	Marks	Guidance
8	(a)	DR		
		Substitute for $y \Rightarrow 2 - x = 2x^2 - 5x + 4$	M1	Substitute
		$\Rightarrow 2x^2 - 4x + 2 = 0$	A1	Correct three term quadratic, possibly unsimplified
		$\Rightarrow x^2 - 2x + 1 = 0$	M1	Solve <i>their</i> 3 term quadratic soi by correct answer. If by formula then the substitutions of <i>their</i> quadratic coefficients into the correct formula – allow one error Both x and y Accept (1,1) (N.B. A DR question so answer only is M0)
		$\Rightarrow (x - 1)^2 = 0$		
		$\Rightarrow x = 1$	A1	
		$y = 1$		
		Alternative method		
		Substitute for $x \Rightarrow y = 2(2 - y)^2 - 5(2 - y) + 4$	M1	
		$\Rightarrow 2y^2 - 4y + 2 = 0$	A1	
		$\Rightarrow y^2 - 2y + 1 = 0$		
		$\Rightarrow (y - 1)^2 = 0 \Rightarrow y = 1$	M1	
		$x = 1$	A1	
			[4]	
	(b)	The line is a tangent to the curve (at (1, 1))	B1	e.g. Tangential
			[1]	

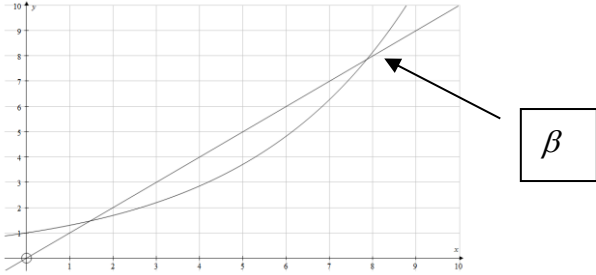
Question			Answer	Marks	Guidance
9	(a)		$AB^2 = 50^2 + 40^2 - 2 \times 50 \times 40 \cos 120$ $= (6100)$ $\Rightarrow AB = 78.1$	M1 A1 A1	Use of correct cosine rule Correct substitutions awrt 78.1 Accept $10\sqrt{61}$
				[3]	
	(b)		Time to travel on motorway $= \frac{90}{v}$ Time to travel on non-motorway $= \frac{78.1}{kv}$ If the same time then $\frac{78.1}{kv} = \frac{90}{v} \Rightarrow k = \frac{78.1}{90} \approx 0.87$	B1 M1 A1	Sight of time for either $t = \frac{90}{v}$ or $v = \frac{90}{t}$ FT their value from (a) Equate or state correct ratio using <i>their</i> value from part (a) Awrt 0.87 Accept $\frac{\sqrt{61}}{9}$ Careful! $90v = \frac{78.1v}{k}$ will give the same answer but is incorrect. SC Correct answer www B1
				[3]	

Question	Answer	Marks	Guidance
10	DR $\frac{1}{x-5} - \frac{1}{x} + \frac{5}{6} = 0$ $\Rightarrow \frac{x-(x-5)}{x(x-5)} = -\frac{5}{6}$ $\Rightarrow \frac{5}{x(x-5)} = -\frac{5}{6}$ $\Rightarrow -6 = x(x-5)$ $\Rightarrow x^2 - 5x + 6 = 0$ Alternative Method 1 $6x - 6(x-5) + 5x(x-5) = 0$ $\Rightarrow 5x^2 - 25x + 30 = 0$ $\Rightarrow x^2 - 5x + 6 = 0$ Alternative method 2 $6x - 6(x-5) + 5x(x-5) = 0$ $\Rightarrow 5x^2 - 25x + 30 = 0$ $\Rightarrow x^2 - 5x + 6 = 0$ $\Rightarrow x = 2, 3$	M1 A1 A1 M1 A1 A1 M1 A1 A1 M1 A1	Combine 2 algebraic fractions on LHS LHS seen Allow missing “= 0” throughout 3 term Quadratic = 0 (may be the numerator of a fraction) Not necessarily simplified Clear fractions 3 term quadratic Not necessarily simplified Combine all three fractions 3 term Quadratic (may be the numerator of a fraction) Not necessarily simplified Solve <i>their</i> 3 term quadratic Both required (but no others)
		[5]	

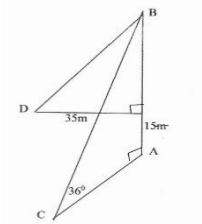
Question		Answer	Marks	Guidance
11	(a)	$y = x^2 - 6x + 16$ $= (x-3)^2 - 9 + 16$ $= (x-3)^2 + 7$ $\Rightarrow$ Coordinates of B are (3, 7)	M1 A1 A1	$(x-3)^2$ must be seen Must include brackets or accept $x = 3, y = 7$ SC Coordinates by correct alternative methods or www B1
			[3]	
	(b)	$A = \int_0^6 (x^2 - 6x + 16) dx$ $= \left[\frac{x^3}{3} - 3x^2 + 16x \right]_0^6$ $= 72 - 108 + 96 = 60$ $\Rightarrow 6 \times k = 30$ $\Rightarrow k = 5$ Alternative method for first 3 marks Area of shape cut out $= \int_0^6 (16 - (x^2 - 6x + 16)) dx$ $= \int_0^6 (-x^2 + 6x) dx = \left[3x^2 - \frac{x^3}{3} \right]_0^6 = 36$ $\Rightarrow$ Remaining area $= 6 \times 16 - 36 = 60$	M1 A1 A1 M1 A1 M1 A1 A1	Attempt to integrate correct equation – ignore limits All powers increased by one and at least one coefficient changed Correct integration Apply appropriate limits to obtain answer (Correct www B3) Derive equation Answer www B5
			[5]	

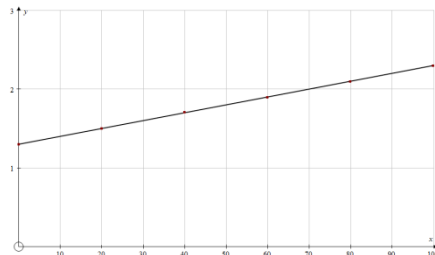
Question	Answer	Marks	Guidance
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12	(a)		$f(1) = 0.3 (> 0)$ $f(2) = -0.31 (< 0)$ Change of sign, so root in between	M1	Correct substitutions seen
				A1	Values correct and conclusion must be seen
				[2]	
	(b)		AG $x_0 = 1.4$ $\Rightarrow x_1 = 1.28246$ $\Rightarrow x_2 = 0.94823$ $\Rightarrow x_3 = -0.20261$ x_4 cannot be found	M1	Substitutes 1.4, gets a value and substitutes again
				A1	At least 3 iterations seen to at least 3sf + conclusion Conclusion must include a reference to the impossibility of finding x_4 , possibly referring to “Maths error” or logs
				[2]	
	(c)	(i)	$x_0 = 1.4$ $\Rightarrow x_1 = 1.3^{1.4} = 1.444$ $\Rightarrow x_2 = 1.3^{1.444} = 1.4606$ $\Rightarrow x_3 = 1.3^{1.4606} = 1.46698$ $\Rightarrow x_4 = 1.3^{1.46698} = 1.4694$ $\Rightarrow x_5 = 1.3^{1.4694} = 1.4703$ i.e. root is 1.47	M1	Substitute
				A1	At least 4 iterations seen to at least 3 dp so answer seen correct to 6 dp or more ($x_{12} = 1.47098896....$)
				A1	
				[3]	

Question			Answer	Marks	Guidance
12	(d)	(i)		B1 B1 B1 B1	At least 3 points correctly plotted Curve correctly drawn (Do not accept points joined by straight lines) Line correctly drawn β labelled either by letter, or ringing or with an arrow etc
				[4]	
		(ii)	[7,8]	B1	Accept any notation
				[1]	
	(e)		Because the gradient of the curve is greater than 1 So a (staircase) diagram will either diverge or converge to the lower root however close to the second root you start.	B1 B1	Reference to gradient Consequence Any comment about diverging from β to give α without mentioning gradient scores B1 'Because the formula will only find α ' scores B0
				[2]	

Question			Answer	Marks	Guidance
13	(a)		$\sin 2\theta = 0.7$ $\Rightarrow 2\theta = 44.4$ $\Rightarrow \theta = 22.2$ Also $2\theta = 180 - 44.4, 360 + 44.4, 540 - 44.4$ $\Rightarrow \theta = 67.8, 202.2, 247.8$	B1 B2,1	All 3, B1 for one value Ignore extra values outside interval For any extra values inside the interval withhold last B mark
				[3]	
	(b)		$\frac{1}{\sin^2 \theta} - \frac{1}{\tan^2 \theta} \equiv \frac{1}{\sin^2 \theta} - \frac{\cos^2 \theta}{\sin^2 \theta}$ $\equiv \frac{1 - \cos^2 \theta}{\sin^2 \theta} \equiv \frac{\sin^2 \theta}{\sin^2 \theta} \equiv 1$	B1 B1 B1dep	Use of $\tan \theta = \frac{\sin \theta}{\cos \theta}$ Use of $\sin^2 \theta + \cos^2 \theta = 1$ oe All correct
				[3]	

Question			Answer	Marks	Guidance
14			$AB = 55 \tan 36$ $= 39.96(\text{m})$ $BX = 40 - 15 = 25$ $\Rightarrow \tan \theta = \frac{25}{35}$ $\Rightarrow \theta = 35.5^\circ$	M1 A1 B1 M1 A1	Correct ratio Accept 40 Their 40 – 15  Correct ratio using their values (If B0 then M0 here) Awr 35.5
				[5]	

Question		Answer	Marks	Guidance
15	(a)	$p = c \times 10^{kt} \Rightarrow \log_{10} p = \log_{10} (c \times 10^{kt})$ $\log_{10} p = \log_{10} (c) + \log_{10} (10^{kt})$ $= \log_{10} (c) + kt [\log_{10} 10]$	M1 B1 A1	Taking logs to give the sum of two terms $\log_{10}(10) = 1$ soi anywhere
			[3]	
	(b)	Values of $\log_{10} p$: 1.3 1.5 1.7 1.9 2.1 2.3 	B2,1 B1	Values which round to 1dp , B1 4 correct, B2 all correct Correct plot for <i>their</i> values N.B Line drawn is part (c)
			[3]	
	(c)	Line as above	B1	Straight line through <i>their</i> points with positive gradient
			[1]	
	(d) (i)	$c = 20$	B1	Awrt 20 Mark final answer
			[1]	
	(ii)	Gradient = $k = 0.01$	B1	Awrt 0.01 Mark final answer
			[1]	
	(e)	$p = 20 \times 10^{1.2}$ $\approx 317 \text{ million}$	M1 A1	Using <i>their</i> c and <i>their</i> k and $t = 120$ Awrt 316 or 317 Must include million or 317 000 000 Accept 316 000 000 Accept answer from their table, giving $\log p = 2.5$
			[2]	
	(f)	e.g. exponential function increases at increasing rate which would not be possible for a country with finite area	B1	Increasing rate (or exponential) should be mentioned. No credit for “other factors” For exemplar responses see the end of the MS
			[1]	

Question		Answer	Marks	Guidance
16	(a)	Let P be the centre of the circle, radius r. Then $OP = BP = r$ $\Rightarrow r^2 = 8^2 + (16 - r)^2$ $\Rightarrow 32r = 320$ $\Rightarrow r = 10$ Alternative method 1 Let the end of the diameter through O be T. Angle in semicircle = 90° so $BT \perp OB$ Line OB has equation $y = -2x$ $\Rightarrow$ Line BT has equation $y - 16 = \frac{1}{2}(x + 8)$ i.e. $y = \frac{1}{2}x + 20$ When $x = 0$, $y = 20$ i.e. length of diameter = 20 $\Rightarrow$ radius = 10 Alternative method 2. Midpoint of BC is M Angle BOM = MBT = 26.6 giving $MT = 8 \tan 26.6 = 4$ so diameter = 20 and radius 10	M1 M1 A1 A1 M1 M1 A1 A1	Choice of triangle Use of Pythagoras Quadratic equation Attempt to find both lines using $m_1 m_2 = -1$ Eqn of BT Conclusion SC If approximate value for angle is used then B3 If tanBOM is used with no approximation then B4 Other methods giving an exact answer will be B4 (e.g. use of a triangle with radius as hypotenuse.)
			[4]	
	(b)	Centre is (0, 10) $(x - 0)^2 + (y - 10)^2 = 100$	B1 M1 A1	Substituting <i>their</i> centre and radius into the correct formula Can be $x^2 + y^2 - 20y = 0$
			[3]	

Question 6(b) exemplars

The car is stationary at $t = 9$ and then reverses B2

The car starts to go backwards B1

When $t > 9$ the car goes backwards B1

The car is returning back to its original position B1

The car is decelerating B0

When time is over 9 the car begins to decelerate B0

Question 15(f) Exemplars

As other factors may cause change e.g. diseases B0

The model is exponential and so the rate of increase will get bigger which cannot happen B1

The model will give increasing population which would be not possible B0

The country would not be able to sustain such a large population B0

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