Cambridge Assessment International Education

Cambridge IGCSE™

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/06**

Paper 6 Investigation and Modelling (Extended) **For examination from 2025**

MARK SCHEME

Maximum Mark: 50

Specimen

This document has **8** pages.

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptions for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptions for the question
- the specific skills defined in the mark scheme or in the generic level descriptions for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptions.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptions in mind.

Mathematics-Specific Marking Principles

1 Unless a particular method has been specified in the question, full marks may be awarded for any correct method. However, if a calculation is required then no marks will be awarded for a scale drawing.

2 Unless specified in the question, non-integer answers may be given as fractions, decimals or in standard form. Ignore superfluous zeros, provided that the degree of accuracy is not affected.

3 Allow alternative conventions for notation if used consistently throughout the paper, e.g. commas being used as decimal points.

4 Unless otherwise indicated, marks once gained cannot subsequently be lost, e.g. wrong working following a correct form of answer is ignored (isw).

5 Where a candidate has misread a number in the question and used that value consistently throughout, provided that number does not alter the difficulty or the method required, award all marks earned and deduct just 1 A or B mark for the misread.

6 Recovery within working is allowed, e.g. a notation error in the working where the following line of working makes the candidate's intent clear.

MARK SCHEME NOTES

The following notes are intended to help with understanding of mark schemes in general, but individual mark schemes may include marks awarded for specific reasons outside the scope of these notes.

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.

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 M or B mark is dependent on an earlier mark in the scheme.

Types of mark

M Method mark, awarded for a valid method applied to the problem.

A Accuracy mark, given for a correct answer or intermediate step correctly obtained. For accuracy marks to be given, the associated Method mark must be earned or implied.

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

C Communication mark, for clear mathematical communication and reasoning.

Abbreviations

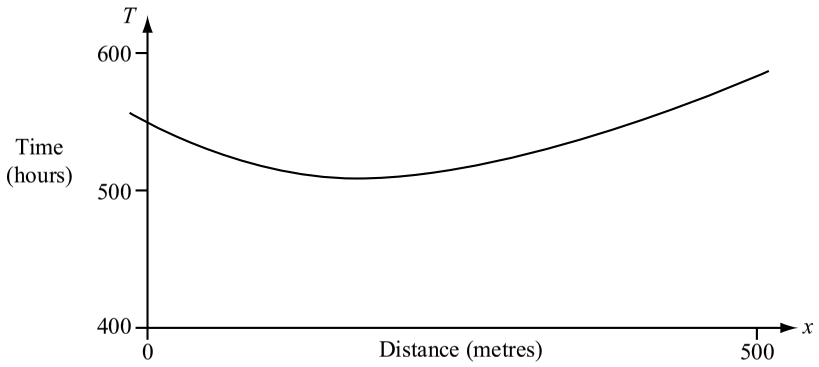
awrt	answers which round to
cao	correct answer only
dep	dependent on the previous mark(s)
FT	follow through after error
isw	ignore subsequent working (after correct answer obtained)
nfww	not from wrong working
oe	or equivalent
SC	special case
soi	seen or implied

Section A

Question	Answer	Marks	Partial Marks
1(a)	$\frac{1}{2} \times$ (4, 6 or 8) $\times 1$	**C1**	For showing working to get value in table
	<table><tr><td></td><td>1st</td><td>2nd</td><td>3rd</td><td>4th</td><td>5th</td><td>6th</td></tr><tr><td>A</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>p</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td><td>14</td></tr></table>	**2**	**B1** for each row
1(b)	Three differences seen	**C1**	
	$p = 2A + 2$ oe	**2**	**B1** for $2A + 2$
1(c)	$A = \frac{1}{2}p - 1$ oe	**2**	**FT** *their* **(b)** if linear with two terms and coefficient of A more than 1 **B1** for $\frac{1}{2}p$
2(a)	$\frac{1}{2} \times 2 \times$ (2, 3 or 4)	**C1**	
	2, 3, 4	**1**	
2(b)	The value of i gives the increase in area for the formula in **1(c)**	**1**	
3	3	**1**	
4	$p = 12$ and $i = 10$ soi	**1**	
	$\frac{1}{2} \times 12 + 10 - 1$	**1**	**FT** *their p* and *i*
	$[A =] 5 \times 2 + \frac{1}{2} \times 5 \times 2$ or $5 \times 4 - \frac{1}{2} \times 3 \times 2 - \frac{1}{2} \times 2 \times 2$	**1**	If correct division of shape seen allow 10 for 5×2, 5 for $\frac{1}{2} \times 5 \times 2$, etc.
	15 calculated from Pick and from area	**1**	
5	$\frac{1}{2} \times 7 + 4 - 1$	**C1**	
	6.5	**1**	

Question	Answer	Marks	Partial Marks
6	$\frac{1}{2}p + i - 1 = 4$ or better	**C1**	
	$p = 10$ $i = 0$ $p = 8$ $i = 1$ $p = 6$ $i = 2$ $p = 4$ $i = 3$	**C2**	**C1** for one pair
	4	**1**	
7	**EITHER** Substitution of $i = p^2$ and rearrangement to = 0 on one side or graph of relevant quadratic	**C1**	
	$(2p + 21)(p - 10)$ or $p = \frac{-1 \pm \sqrt{1^2 - 4 \times 2 \times (-210)}}{2 \times 2}$ or intersection point on graph marked	**C1**	
	Yes and $p = 10$	**1**	
	OR One pair of p and i satisfying $\frac{1}{2}p + i - 1 = 104$	**(C1)**	p 2 4 6 8 10 12 14 … i 104 103 102 101 100 99 98 …
	Three pairs of p and i satisfying $\frac{1}{2}p + i - 1 = 104$	**(C1)**	
	Yes and $10^2 = 100$ or $p = 10$, $i = 100$	**(1)**	

Section B

Question	Answer	Marks	Partial Marks
8	Evidence of using Pythagoras and $\sqrt{(500^2 + 300^2)}$	**C2**	**C1** for evidence of using Pythagoras or $\sqrt{(500^2 + 300^2)}$
	583	**1**	
9	800	**1**	
	metres or m	**C1**	
10(a)	$500 - x$ seen as a distance	**1**	
	$[PC^2 =] 300^2 + x^2$	**1**	
	time = $\frac{\textit{their}\text{ distance}}{\text{speed}}$ soi	**1**	
10(b)	Valid reason relating to the context, e.g. time added to change the drill's direction or repair the drill	**1**	
10(c)	Correct sketch  	**4**	**B1** concave curve **B1** minimum in the left half and T at $x = 500$ larger than 550 **B1** graph reaches T-axis at approx 550 **B1** finishes at $x = 500$ and $560 < T < 590$
10(d)(i)	173	**1**	
10(d)(ii)	510	**1**	If 0 scored in parts **(i)** and **(ii)** **SC1** for 173.2… and 509.8…

Question	Answer	Marks	Partial Marks
11(a)	$n = 500 - x + 3\sqrt{90\,000 + x^2}$ oe	**2**	**B1** for $500 - x$ or $3\sqrt{90\,000 + x^2}$ Allow $\frac{2(500-x)}{2}$ for $500 - x$
11(b)	$500 - 412.5 = 87.5$	**C1**	
	$500 - 87.5 + 3\sqrt{90\,000 + 87.5^2}$	**C1**	**FT** *their* **(a)** if similar form Allow 412.5 for $500 - 87.5$
	[$]1 350 000 or [$]1350 thousand	**2**	**B1** for [n =] 1350 **FT** *their* **(a)** if similar form
12(a)	The equation of a graph given as $T = \frac{d-x}{2} + \sqrt{90\,000 + x^2}$ with $d > 500$ or at least two sketches of T seen	**C1**	
	x stays the same oe	**1**	
12(b)	Substitute *their* $x = 173$[.2…] in $\frac{d-x}{2} + \sqrt{90\,000 + x^2}$	**C1**	
	$t = \frac{d}{2} + 260$	**1**	Allow awrt 260