

## **Cambridge Assessment International Education**

Cambridge International General Certificate of Secondary Education

#### **CAMBRIDGE INTERNATIONAL MATHEMATICS**

0607/52

Paper 5 (Core)

October/November 2017

MARK SCHEME
Maximum Mark: 24

#### **Published**

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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#### MARK SCHEME NOTES

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

### Types of mark

- M Method marks, awarded for a valid method applied to the problem.
- A Accuracy mark, awarded 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.

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.

#### **Abbreviations**

awrt answers which round to cao correct answer only

dep dependent

FT follow through after error isw ignore subsequent working nfww not from wrong working

oe or equivalent

rot rounded or truncated

SC Special Case soi seen or implied

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| 1(a)       9       1         1(b)       3 is added two times oe or       1         1 is added to 3 and not 2 oe       2         2(a)       8       12         3       5       7         2(b)       A correct number wall with total > their 20       2         3(a)       A correct number wall with total > their 20       3         3(a) $a + 2b + c$ $a + b$ $b + c$ 2         3(a) $a + 2b + c$ $b + c$ 2         3(b)       -2       1         4(a) $a + 3b + 3c + d$ $b + 2c + d$ $c + d$ 2         4(b) $a + 3b + 3c + d$ $b + 2c + d$ $c + d$ 2         4(b) $a + 3b + 3c + d$ $a + 3c + 3c + 3c + d$ $a + 3c + 3$  | Question | Answer  | Marks | Partial Marks              |
|--|----------|---|-------|----------------------------|
| 2(a)   20   8   12   12   12   13   15   15   15   15   15   15   15   | 1(a)     |   | 1     |                            |
| 1 is added to 3 and not 2 oc   2   2   3   5   7   2   2   3   5   7   7   2   2   3   5   5   7   2   2   3   5   5   7   2   3   5   5   7   2   3   5   5   7   2   3   5   5   7   2   2   3   5   5   7   2   3   3   5   5   7   3   3   3   4   3   5   5   7   3   3   3   4   3   5   5   5   7   3   3   3   3   4   4   5   5   5   5   5   5   5   5   | 1(b)     | 3 is added two times oe                               | 1     |                            |
| 2(a)       20<br>8 12<br>3 5 7       2       BI for 3 5 7 or for top three numbers correct following one error         2(b)       A correct number wall with total > their 20       2       BI for a number wall with (2 and 4) or (3 and 4) in middle of bottom row         2(c)       14 17 7 3       3       BI for each row         3(a) $a + 2b + c$ $a + b + b + c$ 2       BI for each row         3(b)       -2       1       C opportunity         4(a) $a + 3b + 3c + d$ $a + 2b + c$ $b + 2c + d$ $b + c$ $c + d$ 2       BI for 3 cells correct, may be unsimplified         4(b)       their $(a + 3b + 3c + d) = 34$ oe       MI       C opportunity         4(c)       3 5 1 2 6 or 4 8 is not an integer oe       2       BI for $c = 1$ and $d = 2$ or $c = 2$ and $d = 1$ C opportunity         5(a)       Row gives the coefficients of $a, b, c$ and $d$ 2       BI for each         5(b) $[1]a + 4b + 6c + 4d + [1]e$ oe       1       FI their correct 5(b) only         5(c) $[1]x + 4c + 4c + 2c + 4c + 1c + 4c + 1c + 4c + 4c + 4c + 4$   |          | or  |       |                            |
|  |          | 1 is added to 3 and not 2 oe                          |       |                            |
| with total > their 20       (3 and 4) in middle of bottom row         2(c) $14$ $17$ $-3$ $3$ 3(a) $a + 2b + c$ $a + b$ $a + b$ $b + c$ $a + b$ 3(b) $-2$ $a + 3b + 3c + d$ $a + 2b + c$ $a + 2b + c$ $b + 2c + d$ $a + 2b + c$ $a + 2b + 2c + d$ $a + 2b + c$ $a + 2b + c$ $a + 2b + c$ $a + 2b + 3c + d$ $a + 2b + 3c + d$ $a + 2b + 3c + d$ $a + 2b + c$ $a + 2b + 3c + d$ $a + 2b + 3c + d$ $a + 2b + 3c + d$ <t< td=""><td>2(a)</td><td>8 12</td><td>2</td><td></td></t<>   | 2(a)     | 8 12  | 2     |                            |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$  | 2(b)     |   | 2     |                            |
| $a+b$ $b+c$ 3(b) $-2$ 1       C opportunity         4(a) $a+3b+3c+d \\ a+2b+c & b+2c+d \\ b+c & c+d$ 2       B1 for 3 cells correct, may be unsimplified         4(b)       their $(a+3b+3c+d)=34$ oe       M1       C opportunity         4(c) $3 + 5 + 2 = 6 = 6 = 6 = 6 = 6 = 6 = 6 = 6 = 6 =$  | 2(c)     | 7   | 3     | B1 for each row            |
| 4(a) $a + 3b + 3c + d$ $a + 2b + c$ $b + 2c + d$ $b + c$ $c + d$ 4(b) $their (a + 3b + 3c + d) = 34$ oe  4(c) $3 	 5 	 1 	 2 	 6$ or $4 	 4 	 2 	 1 	 7$ 4(c) $a 	 5 	 6 	 0$ or $a 	 4 	 4 	 2 	 1 	 7$ 5(a) Row gives the coefficients of $a$ , $b$ , $c$ and $d$ 5(b) $a 	 6 	 1 	 1 	 2 	 1 	 3 	 4 	 4 	 5 	 6 	 6 	 4 	 4 	 2 	 1 	 7 	 1 	 1 	 1 	 1 	 1 	 1 	 1 	 1$   | 3(a)     |   | 2     | B1 for each row            |
| $a + 2b + c \qquad b + 2c + d \qquad \text{unsimplified}$ $4(b) \qquad their (a + 3b + 3c + d) = 34 \text{ oe} \qquad \mathbf{M1} \qquad \mathbf{C} \text{ opportunity}$ $4.25 \qquad \mathbf{M1}$ $4(c) \qquad 3 \qquad 5 \qquad 1 \qquad 2 \qquad 6 \qquad \qquad \mathbf{C} \qquad \mathbf{C} = 1 \text{ and } d = 2 \text{ or } c = 2 \text{ and } d = 1 \text{ C opportunity}}$ $5(a) \qquad \mathbf{Row gives the coefficients of } a, b, c \text{ and } d \qquad \mathbf{C} \qquad \mathbf{C} = \mathbf{C} \qquad \mathbf{C} \qquad \mathbf{C} = \mathbf{C} \qquad \mathbf$ | 3(b)     | -2  | 1     | C opportunity              |
| 4.25 or $\frac{34}{8}$ is not an integer oe  4(c) $3 	 5 	 1 	 2 	 6$ or $4 	 4 	 2 	 1 	 7$ 5(a) Row gives the coefficients of $a, b, c$ and $d$ 5(b) $[1]a + 4b + 6c + 4d + [1]e$ oe  5(c) $[1] \times 3 + 4 \times 5 + 6 \times 1 + 4 \times 2 + [1] \times 6 [= 43]$ or $[1] \times 4 + 4 \times 4 + 6 \times 2 + 4 \times 1 + [1] \times 7 [= 43]$ M1  M1  2 B1 for $c = 1$ and $d = 2$ or $c = 2$ and $d = 1$ C opportunity  1 FT their correct 5(b) only  | 4(a)     | a+2b+c $b+2c+d$                                       | 2     |                            |
| or $\frac{34}{8}$ is not an integer oe  4(c) $3 	 5 	 1 	 2 	 6$ or $4 	 4 	 2 	 1 	 7$ 2 B1 for $c = 1$ and $d = 2$ or $c = 2$ and $d = 1$ C opportunity  5(a) Row gives the coefficients of $a$ , $b$ , $c$ and $d$ 2 B1 for each  3  5(b) $[1]a + 4b + 6c + 4d + [1]e$ oe  1  5(c) $[1] \times 3 + 4 \times 5 + 6 \times 1 + 4 \times 2 + [1] \times 6 [= 43]$ or $[1] \times 4 + 4 \times 4 + 6 \times 2 + 4 \times 1 + [1] \times 7 [= 43]$ 1 FT their correct 5(b) only  | 4(b)     | their $(a + 3b + 3c + d) = 34$ oe                     | M1    | C opportunity              |
| or $4 \ 4 \ 2 \ 1 \ 7$ or $c = 2$ and $d = 1$ C opportunity  5(a) Row gives the coefficients of $a$ , $b$ , $c$ and $d$ 2 B1 for each  5(b) $[1]a + 4b + 6c + 4d + [1]e$ oe  1 $[1] \times 3 + 4 \times 5 + 6 \times 1 + 4 \times 2 + [1] \times 6 [= 43]$ or $[1] \times 4 + 4 \times 4 + 6 \times 2 + 4 \times 1 + [1] \times 7 [= 43]$  |          |   | M1    |                            |
| 3 $5(b) \qquad [1]a + 4b + 6c + 4d + [1]e \text{ oe} \qquad \qquad 1$ $5(c) \qquad [1] \times 3 + 4 \times 5 + 6 \times 1 + 4 \times 2 + [1] \times 6 [= 43] \qquad \qquad 1 \qquad \text{FT their correct 5(b) only}$ $[1] \times 4 + 4 \times 4 + 6 \times 2 + 4 \times 1 + [1] \times 7 [= 43]$   | 4(c)     | or  | 2     | or $c = 2$ and $d = 1$     |
| 5(b) $[1]a + 4b + 6c + 4d + [1]e$ oe 1  5(c) $[1] \times 3 + 4 \times 5 + 6 \times 1 + 4 \times 2 + [1] \times 6 [= 43]$ 1 FT their correct 5(b) only or $[1] \times 4 + 4 \times 4 + 6 \times 2 + 4 \times 1 + [1] \times 7 [= 43]$   | 5(a)     | Row gives the coefficients of $a$ , $b$ , $c$ and $d$ | 2     | B1 for each                |
| 5(c) $[1] \times 3 + 4 \times 5 + 6 \times 1 + 4 \times 2 + [1] \times 6 = 43$ 1 FT their correct 5(b) only or $[1] \times 4 + 4 \times 4 + 6 \times 2 + 4 \times 1 + [1] \times 7 = 43$   |          | 3   |       |                            |
| or $[1] \times 4 + 4 \times 4 + 6 \times 2 + 4 \times 1 + [1] \times 7 [= 43]$   | 5(b)     | [1]a + 4b + 6c + 4d + [1]e oe                         | 1     |                            |
| 5(d) 32272 1 C opportunity   | 5(c)     | or  | 1     | FT their correct 5(b) only |
|  | 5(d)     | 32272   | 1     | C opportunity              |

# Cambridge IGCSE – Mark Scheme **PUBLISHED**

| Question  | Answer   | Marks | Partial Marks |  |
|---|--|-------|---------------|--|
| Communication: seen in one of the following questions |  | 1     |               |  |
| 3(b)  | their (a+2b+c) = 7   |       |               |  |
| 4(b)  | $8x = 34$ or $x + 3x + 3x + x = 34$ or $34 \div 8$                                     |       |               |  |
| 4(c)  | Completing all empty bricks with 23, 20, 11, 8, 3, 8 or showing working with equations |       |               |  |
| 5(d)  | Relevant working $1 + 4 + 6 + 4 + 1$ or $16 \times 2017$ or completing the number wall |       |               |  |

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