

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

## **MARK SCHEME for the May/June 2015 series**

# **0607 CAMBRIDGE INTERNATIONAL MATHEMATICS**

**0607/62**

Paper 6 (Extended), maximum raw mark 40

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Abbreviations

|      |                            |
|------|----------------------------|
| cao  | correct answer only        |
| dep  | dependent                  |
| FT   | follow through after error |
| isw  | ignore subsequent working  |
| oe   | or equivalent              |
| SC   | Special Case               |
| nfww | not from wrong working     |
| soi  | seen or implied            |

| <b>A INVESTIGATION</b> |                |                         |                        |
|------------------------|----------------|-------------------------|------------------------|
| <b>1</b>               | <b>(a)</b>     |                         | <b>1</b>               |
|                        | <b>(b)</b>     | 4 3<br>5 4<br>6 5       | <b>1</b>               |
|                        | <b>(c)</b>     | $[s =] m$               | <b>1</b>               |
| <b>2</b>               | <b>(a)</b>     | 8 10<br>10 13<br>12 16  | <b>1</b>               |
|                        | <b>(b) (i)</b> | $[s =] 2m$ oe           | <b>1</b>               |
|                        | <b>(ii)</b>    | $[r =] 3m - 2$ oe       | <b>1</b> C opportunity |
| <b>3</b>               | <b>(a)</b>     | 12 17<br>15 22<br>18 27 | <b>1</b>               |
|                        | <b>(b) (i)</b> | $[s =] 3m$ oe           | <b>1</b>               |
|                        | <b>(ii)</b>    | $[r =] 5m - 3$ oe       | <b>1</b> C opportunity |

|        |                                 |          |       |
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|  |  |  |   |  |      |          |      |          |      |          |      |          |      |           |   |  |
|--|--|--|---|--|------|----------|------|----------|------|----------|------|----------|------|-----------|---|--|
| 4  | (a)                                    | <table border="1"> <tr> <td><math>m</math></td> <td><math>m - 1</math></td> </tr> <tr> <td><math>2m</math></td> <td><math>3m - 2</math></td> </tr> <tr> <td><math>3m</math></td> <td><math>5m - 3</math></td> </tr> <tr> <td><math>4m</math></td> <td><math>7m - 4</math></td> </tr> <tr> <td><math>5m</math></td> <td><math>9m - 5</math></td> </tr> <tr> <td><math>6m</math></td> <td><math>11m - 6</math></td> </tr> </table> | $m$   | $m - 1$  | $2m$ | $3m - 2$ | $3m$ | $5m - 3$ | $4m$ | $7m - 4$ | $5m$ | $9m - 5$ | $6m$ | $11m - 6$ | 2 | <b>B1</b> for row 4<br><b>B1</b> for row 6<br>If <b>0</b> scored, <b>SC1</b> for one correct column of 6 items |
|  | $m$                                    | $m - 1$  |   |  |      |          |      |          |      |          |      |          |      |           |   |  |
|  | $2m$                                   | $3m - 2$   |   |  |      |          |      |          |      |          |      |          |      |           |   |  |
|  | $3m$                                   | $5m - 3$   |   |  |      |          |      |          |      |          |      |          |      |           |   |  |
|  | $4m$                                   | $7m - 4$   |   |  |      |          |      |          |      |          |      |          |      |           |   |  |
| $5m$   | $9m - 5$                               |  |   |  |      |          |      |          |      |          |      |          |      |           |   |  |
| $6m$   | $11m - 6$                              |  |   |  |      |          |      |          |      |          |      |          |      |           |   |  |
| (b) (i)  | $[s =] hm$ oe                          | 1  |   |  |      |          |      |          |      |          |      |          |      |           |   |  |
| (b) (ii)   | $[r =] (2h - 1)m - h$ oe isw           | 1  |   |  |      |          |      |          |      |          |      |          |      |           |   |  |
| (c)  | $[m =] \frac{s}{h}$                    | 1  |   |  |      |          |      |          |      |          |      |          |      |           |   |  |
| (d)  | $[r =] (2h - 1)\frac{s}{h} - h$ oe isw | 1FT  | <b>FT</b> substituting <i>their 4(c)</i> in <i>their 4(b)(ii)</i> |  |      |          |      |          |      |          |      |          |      |           |   |  |
| 5  | (a)                                    | $\frac{s}{h} = w$ oe<br><br>$r = (2h - 1)w - h$  | 2   | <b>B1</b> can be implied by seeing substitution of $w = \frac{s}{h}$ or $s = wh$ in <i>their 4(d)</i><br><b>B1</b>   |      |          |      |          |      |          |      |          |      |           |   |  |
|  | (b)                                    | Yes, if $h = 17$ (only) oe   | 2   | <b>M1</b> for $544 = 2h^2 - 2h$ with attempt to solve by factorisation, formula, sketch, completing the square, approximation or trial and improvement with three improving trials<br><br>If <b>0</b> scored, <b>SC1</b> for 17 (without wrong working) or for Yes if 17 and -16 |      |          |      |          |      |          |      |          |      |           |   |  |
| Communication seen in one of <b>2(b)(ii)</b> , <b>3(b)(ii)</b> , <b>5(b)</b> |  |  | 1   |  |      |          |      |          |      |          |      |          |      |           |   |  |

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| B MODELLING |         |   |                  |   |
|-------------|---------|---|------------------|---|
| 1           | (a)     | 8 points correctly plotted  | 2                | B1 for 6 or 7 correct   |
|             | (b) (i) | $y = x + 3$ oe  | 2                | M1 for $m = 1$ soi by, e.g. $y = x$   |
|             | (ii)    | 3   | 1                | C opportunity   |
| 2           | (a)     | $0 = 0^{[2]} + 0 + c$   | 1                |   |
|             | (b) (i) | $5 = 4a + 2b$ oe isw  | 1                |   |
|             | (ii)    | $8 = 25a + 5b$ oe isw   | 1                |   |
|             | (c)     | Equating coefficients soi<br>or<br>writing one equation correctly as $a =$ or $b =$<br><br>Combining <i>their</i> equations correctly to eliminate one variable<br>or<br>substitution of $a$ or $b$<br><br>$a = -0.3$ or $b = 3.1$ oe<br><br><i>their</i> second variable correct | M1FT<br><br>M1FT | FT <i>their</i> 2(b) if coefficients not equal  |
|             | (d)     | Parabola through (0, 0) with local maximum seen   | 1                | C opportunity   |
|             | (e)     | Not valid oe and $y$ decreases soi by, e.g. $\max = 8$<br>or<br>Valid oe for $[0 <] x < 5$ or less than max<br>or<br>Invalid oe for $x > 5$<br>or<br>Not valid oe and negative oe   | 1                | dep on both method marks<br><br>dep on one method mark<br>FT <i>their</i> first variable in one of <i>their</i> equations in 2(b)<br><br>If 0 scored, SC1 for $a = -0.3$ and $b = 3.1$ or correct model without working |

|               |  |                 |              |
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|  |            |  |          |   |
|--|------------|--|----------|---|
| <b>3</b>   | <b>(a)</b> | $5 = a2^b$ $8 = a5^b$ isw  | <b>1</b> |   |
|  | <b>(b)</b> | $\frac{8}{5} = \frac{a5^b}{a2^b}$ soi  | <b>1</b> |   |
|  | <b>(c)</b> | $\frac{\log 1.6}{\log 2.5}$ or $\log_{2.5} 1.6$<br>or $2.5^{0.513} = 1.6$<br>or $2.5^m =$ a value less than 1.6 with $2.5^n =$ a value more than 1.6 | <b>1</b> | $2.5^b = 1.6$ and $b = 0.513$<br>$0.45 \leq m < 0.5125\dots$<br>with<br>$0.5135\dots < n \leq 0.55$ . |
|  | <b>(d)</b> | $y = 3.5x^{0.5}$ oe  | <b>1</b> | Model must be written in full   |
|  | <b>(e)</b> | close fit or suitable oe   | <b>1</b> | <b>dep</b> on model in <b>(d)</b>   |
| Communication seen in one of <b>1(b)(ii)</b> , <b>2(d)</b> |            |  | <b>1</b> |   |