



**Cambridge Assessment International Education**  
Cambridge International General Certificate of Secondary Education

---

**MATHEMATICS**

**0580/32**

Paper 3 (Core)

**March 2019**

MARK SCHEME

Maximum Mark: 104

---

**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.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the March 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

---

This document consists of 7 printed 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 descriptors 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 descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors 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 descriptors.

**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 descriptors in mind.

**Abbreviations**

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

| Question  | Answer                                                         | Marks | Partial Marks                                                                                                   |
|-----------|----------------------------------------------------------------|-------|-----------------------------------------------------------------------------------------------------------------|
| 1(a)(i)   | Swimming                                                       | 1     |                                                                                                                 |
| 1(a)(ii)  | $\frac{72}{360}$ oe                                            | 1     |                                                                                                                 |
| 1(a)(iii) | 5 cao                                                          | 2     | <b>M1</b> for $\frac{30}{360}[\times 60]$ or $\frac{60}{360}[\times 30]$<br>or for $\frac{360}{60}$ soi by 6    |
| 1(a)(iv)  | $\frac{55}{60}$ oe                                             | 1     | <b>FT</b> $\frac{60 - \text{their(a)(iii)}}{60}$ oe                                                             |
| 1(a)(v)   | Tennis, Judo                                                   | 1     |                                                                                                                 |
| 1(b)      | 2 sectors drawn:<br>Running $60^\circ$<br>Swimming $132^\circ$ | 2     | <b>M1</b> for use of $12^\circ$ implied by $60^\circ$ or $132^\circ$<br>seen or for 10 [boys] or 22 [boys] seen |
| 1(c)      | A valid correct similarity and difference                      | 2     | <b>B1</b> for each                                                                                              |
| 2(a)      | $\frac{4}{15}$ cao                                             | 2     | <b>M1</b> for $\frac{8}{30}$                                                                                    |
| 2(b)      | $\frac{7k}{12k}$ $k \neq 1$                                    | 1     |                                                                                                                 |
| 2(c)      | $\frac{11k}{13k}$                                              | 1     |                                                                                                                 |
| 2(d)      | Any correct fraction                                           | 1     |                                                                                                                 |
| 2(e)      | $5.7 \times 10^{-1}$ , $\frac{4}{7}$ , 57.2%, $\sqrt{0.33}$    | 2     | <b>B1</b> for 3 in correct order<br><b>M1</b> for 3 of 0.57, 0.571[....], 0.574[....], 0.572                    |

0580/32

Cambridge IGCSE – Mark Scheme  
PUBLISHED

March 2019

| Question    | Answer                                         | Marks | Partial Marks                                                                                                                                                                                                                                               |
|-------------|------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3(a)        | 6 : 5 : 4                                      | 2     | <b>M1</b> for 1200 : 1000 : 800 or better                                                                                                                                                                                                                   |
| 3(b)        | 204000                                         | 2     | <b>M1</b> for $240000 \times \left(1 - \frac{15}{100}\right)$ oe                                                                                                                                                                                            |
| 3(c)        | 832 or 831.5 or 831.53 or 831.54 or 831.538... | 3     | <b>M2</b> for $750 \times \left(1 + \frac{3.5}{100}\right)^3$ oe<br><br>or <b>M1</b> for $750 \times \left(1 + \frac{3.5}{100}\right)^2$ oe                                                                                                                 |
| 4(a)        | 800                                            | 2     | <b>M1</b> for $\frac{10}{10+1} [\times 880]$ or $\frac{880}{10+1} [\times 10]$ oe                                                                                                                                                                           |
| 4(b)        | 220                                            | 1     |                                                                                                                                                                                                                                                             |
| 4(c)        | $\frac{31}{40}$ or equivalent fraction         | 3     | <b>M2</b> for $1 - \left(\frac{1}{40} + \frac{1}{5}\right)$ oe<br><br>or <b>M1</b> for $\frac{1}{40} + \frac{1}{5}$ oe<br><br>OR<br><br><b>B2</b> for 682<br>or <b>M1</b> for $\frac{1}{40} \times 880$ soi by 22<br>or $\frac{1}{5} \times 880$ soi by 176 |
| 4(d)(i)     | 4.5[0]                                         | 1     |                                                                                                                                                                                                                                                             |
| 4(d)(ii)(a) | 09 50                                          | 1     |                                                                                                                                                                                                                                                             |
| 4(d)(ii)(b) | 11.5[0]                                        | 1     |                                                                                                                                                                                                                                                             |
| 4(d)(iii)   | 6.5[0]                                         | 3     | <b>B2</b> for 32.5<br>or <b>M2</b> for $([0] + 8.5 + 12 + 12) - 26$<br>or <b>M1</b> for $[0] + 8.5 + 12 + 12$                                                                                                                                               |
| 5(a)        | 4 tables and 14 chairs correctly drawn         | 1     |                                                                                                                                                                                                                                                             |
| 5(b)        | 14, 16, 18                                     | 2     | <b>B1</b> for 2 correct or $k, k+2, k+4$                                                                                                                                                                                                                    |
| 5(c)        | $2t+6$ oe final answer                         | 2     | <b>B1</b> for $2t+j$ or $kt+6, k \neq 0$                                                                                                                                                                                                                    |
| 5(d)        | 42 cao                                         | 2     | <b>M1</b> for 18 correctly substituted into <i>their (c)</i> , provided a linear expression                                                                                                                                                                 |
| 5(e)        | 37 cao                                         | 2     | <b>M1</b> for <i>their (c)</i> = 80                                                                                                                                                                                                                         |

| Question | Answer                                                                                                                                                                                                  | Marks | Partial Marks                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6(a)     | 55                                                                                                                                                                                                      | 1     |                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 6(b)     | 108                                                                                                                                                                                                     | 2     | <b>M1</b> for $\frac{18}{10} \times [60]$ oe                                                                                                                                                                                                                                                                                                                                                                          |
| 6(c)     | Correct graph<br>Ruled lines<br>(09 55, 31.5) to (10 30, 31.5)<br><br>(10 30, 31.5) to (10 50, 30)<br><br>(10 50, 30) to (11 10, 12)<br><br>(11 10, 12) to (11 20, 12)<br><br>(11 20, 12) to (11 35, 0) | 4     | <b>B1</b> for ruled lines<br>(09 55, 31.5) to (10 30, 31.5)<br>and (10 30, 31.5) to (10 50, 30)<br><br><b>B1</b> for ruled line from ( <i>their</i> 10 50, 30) to<br>( <i>their</i> 10 50+20, 12)<br><br><b>B1</b> for ruled line from ( <i>their</i> 11 10, 12) to<br>( <i>their</i> 11 10+10, 12)<br><br><b>B1</b> for ruled line<br>( <i>their</i> 11 20, 12) to ( <i>their</i> 11 20+15, 0)<br>or for 15 mins soi |
| 7(a)     | 19.2                                                                                                                                                                                                    | 2     | <b>B1</b> for 9.6 cm seen                                                                                                                                                                                                                                                                                                                                                                                             |
| 7(b)     | [0]45                                                                                                                                                                                                   | 1     |                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 7(c)     | Correct ruled perpendicular bisector<br>with 2 pairs of arcs                                                                                                                                            | 2     | <b>B1</b> for correct bisector drawn without arcs<br>or for two pairs of correct arcs                                                                                                                                                                                                                                                                                                                                 |
| 7(d)     | <i>K</i> marked correctly twice                                                                                                                                                                         | 4     | <b>B1</b> for line indicating correct bearing of<br>203° measured<br><br><b>B2</b> for an arc radius 4.4 cm, centre <i>T</i> , the<br>arc length being fit for purpose<br><br>or <b>B1</b> for an arc of any radius, centre <i>T</i><br><br>or <b>M1</b> for $8.8 \div 2$ soi by 4.4<br><br><i>K</i> marked correctly once implies 3 marks                                                                            |
| 7(e)     | 138                                                                                                                                                                                                     | 2     | <b>M1</b> for $318 - 180$ or a correct diagram<br>seen                                                                                                                                                                                                                                                                                                                                                                |

| Question  | Answer                                              | Marks | Partial Marks                                                                                                                                                                                 |
|-----------|-----------------------------------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8(a)      | $[y =] -\frac{1}{2}x + 3$                           | 3     | <b>B2</b> for $[y =] -\frac{1}{2}x + c$<br>or<br><b>M1</b> for $\frac{\text{rise}}{\text{run}}$ or $m = \pm \frac{1}{2}$ oe<br>and <b>B1</b> for $[y =] kx + 3$ , $k \neq 0$<br>or $c = 3$    |
| 8(b)(i)   | -1                                                  | 2     | <b>M1</b> for $[a =] \frac{2}{3} \times 9 - 7$ or better                                                                                                                                      |
| 8(b)(ii)  | 15                                                  | 2     | <b>M1</b> for $3 = \frac{2}{3}b - 7$ or better                                                                                                                                                |
| 8(c)(i)   | -28, -4, 2                                          | 3     | <b>B1</b> for each                                                                                                                                                                            |
| 8(c)(ii)  | correct smooth curve                                | 4     | <b>B3FT</b> for 6 or 7 correct plots<br>or <b>B2FT</b> for 4 or 5 correct plots<br>or <b>B1FT</b> for 2 or 3 correct plots                                                                    |
| 8(c)(iii) | (1.5, 2.25)                                         | 1     | accept (x, y) where<br>$1 < x < 2$ and $2 < y < 4$                                                                                                                                            |
| 9(a)(i)   | 15                                                  | 2     | <b>B1</b> for 4 cm or 8 cm                                                                                                                                                                    |
| 9(a)(ii)  | 428 or 429 or 428.4 or 428.5<br>or 428.49 to 428.52 | 3     | <b>M2</b> for $120 \times 2 + 60\pi$<br>or <b>M1</b> for $60\pi$<br><br>If 0 scored <b>SC1</b> for 28.6 or 28.56 to 28.57                                                                     |
| 9(a)(iii) | 5 minutes 6 seconds                                 | 3     | <b>FT</b> <i>their (a)(ii)</i><br><br><b>M1</b> for $\frac{\text{their (a)(ii)}}{1.4}$<br><b>M1dep</b> for $\div 60$                                                                          |
| 9(b)(i)   | 45                                                  | 2     | <b>M1</b> for $\frac{60 \times 60}{80}$ oe                                                                                                                                                    |
| 9(b)(ii)  | 11, 10                                              | 3     | <b>B2</b> for 880 or $8 \times 10 \times 11$ oe<br><br>or <b>B1</b> for $880k$ , $k > 1$<br>or <b>M1</b> for 80, 160, 240..<br>and 88, 176, 264,..<br>or $8 \times 10$ and $8 \times 11$ seen |

0580/32

Cambridge IGCSE – Mark Scheme  
PUBLISHED

March 2019

| Question | Answer                           | Marks | Partial Marks                                                                                                                                                                                 |
|----------|----------------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10(a)    | correct triangle drawn with arcs | 2     | <b>B1</b> for correct triangle without arcs<br>or for correct arcs                                                                                                                            |
| 10(b)    | 280                              | 2     | <b>M1</b> for $\frac{1}{2}(24+16)\times 14$ oe                                                                                                                                                |
| 10(c)    | 20                               | 3     | <b>M2</b> for $\frac{360}{180-162}$ or better<br><br>or <b>M1</b> for $180-162$<br>or $(n-2)\times 180=162n$ or better                                                                        |
| 10(d)    | 11                               | 3     | <b>M2</b> for $h^2 = \frac{363}{3}$ or better<br><br>or <b>M1</b> for $\frac{1}{2}\times h\times 6h=363$ oe                                                                                   |
| 10(e)    | 62.8 or 62.83 to 62.84           | 3     | <b>M2</b> for $\frac{1}{2}\pi\times 7^2 - \frac{1}{2}\pi\times 3^2$ oe<br><br>or <b>M1</b> for $\left[\frac{1}{2}\times\right]\pi\times 7^2$ or $\left[\frac{1}{2}\times\right]\pi\times 3^2$ |