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**MATHEMATICS**

**1112/01**

Paper 1

**October 2017**

MARK SCHEME

Maximum Mark: 50

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**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 Markers were instructed to award marks. It does not indicate the details of the discussions that took place at a Markers' 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 End of Series report.

Cambridge will not enter into discussions about these mark schemes.

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This document consists of **11** printed pages and **1** blank page.

**Mark scheme annotations and abbreviations**

|           |                            |
|-----------|----------------------------|
| <b>M1</b> | method mark                |
| <b>A1</b> | accuracy mark              |
| <b>B1</b> | independent mark           |
| <b>FT</b> | follow through after error |
| dep       | dependent                  |
| oe        | or equivalent              |
| cao       | correct answer only        |
| isw       | ignore subsequent working  |
| soi       | seen or implied            |

| Question | Answer                                   | Marks | Further Information  |
|----------|--|-------|--|
| 1        | 0.7      0.75      1.1      1.2      2.1 | 1     | All correct for 1 mark.<br>Allow any unambiguous indication of the correct answer. |

| Question | Answer  | Marks | Further Information |
|----------|---|-------|---------------------|
| 2        | (r =) 9   | 2     |                     |
|          | An attempt to subtract 7 from both sides (e.g. $3r = 34 - 7$ )<br>or correct first step, e.g.: $r + \frac{7}{3} = \frac{34}{3}$ | M1    |                     |

| Question | Answer   | Marks | Further Information                                     |
|----------|--|-------|---|
| 3        | $8e$ <input type="checkbox"/><br>$2 + 6 \times e$ <input type="checkbox"/><br>$2e + 6$ <input checked="" type="checkbox"/><br>$6 + e^2$ <input type="checkbox"/> | 1     | Allow any unambiguous indication of the correct answer. |

| Question | Answer | Marks | Further Information |
|----------|--------|-------|---------------------|
| 4        | 56     | 1     |                     |

| Question | Answer  | Marks | Further Information  |
|----------|---|-------|--|
| 5        | $(C =) np$  | 1     | Accept equivalent answers, e.g.:<br>$pn$<br>$n \times p$           |
| Question | Answer  | Marks | Further Information  |
| 6(a)     | <p>millimetres <math>\xrightarrow{\div 10}</math> centimetres<br/> kilograms <math>\xrightarrow{\times 1000}</math> grams<br/> millilitres <math>\xrightarrow{\div 1000}</math> litres</p>                    | 1     | Both correct for 1 mark.   |
| 6(b)     | 0.856 (km)  | 1     |  |
| Question | Answer  | Marks | Further Information  |
| 7        | Name of student <input type="checkbox"/><br>Age of student <input checked="" type="checkbox"/><br>Favourite subject <input type="checkbox"/><br>Time spent doing homework <input checked="" type="checkbox"/> | 1     | Award 1 mark for both boxes ticked and no additional boxes ticked. |

| Question | Answer  | Marks | Further Information                                     |
|----------|---|-------|---|
| 8        | 6   | 1     |   |
| Question | Answer  | Marks | Further Information                                     |
| 9(a)     | $\frac{9}{10}$ oe   | 2     |   |
|          | Correctly converting to a common denominator.<br>e.g.: $\left(\frac{7}{10}\right)$ and $\frac{2}{10}$ , $\frac{35}{50}$ and $\frac{10}{50}$ oe                                  | M1    |   |
| 9(b)     | $2\frac{11}{12}$ oe   | 2     | Accept $\frac{35}{12}$ or $1\frac{23}{12}$ for 2 marks. |
|          | Correctly finding a common denominator.<br>e.g.: $\frac{63}{12}$ and $\frac{28}{12}$<br>or $5\frac{3}{12}$ and $2\frac{4}{12}$<br>or $4\frac{15}{12}$ and $2\frac{4}{12}$<br>oe | M1    |   |
| Question | Answer  | Marks | Further Information                                     |
| 10(a)    | 19.18   | 1     |   |
| 10(b)    | 140   | 1     |   |

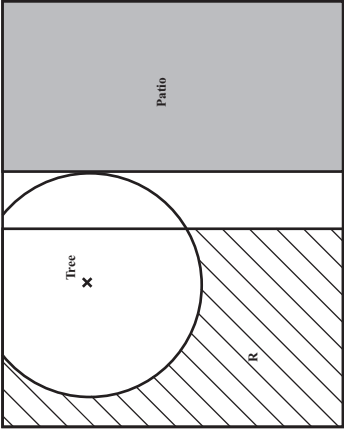
| Question                   | Answer  | Marks              | Further Information                                      |                            |                            |                |                |                |                 |                 |  |   |   |
|----------------------------|---|--------------------|--|----------------------------|----------------------------|----------------|----------------|----------------|-----------------|-----------------|--|---|---|
| 11                         | 5 cm      12 cm      13 cm      30 cm   | 1                  | Accept any unambiguous indication of the correct answer. |                            |                            |                |                |                |                 |                 |  |   |   |
| 12                         | <table border="1"> <thead> <tr> <th>Recurring decimals</th> <th>Terminating decimals</th> </tr> </thead> <tbody> <tr> <td><math>\left(\frac{1}{3}\right)</math></td> <td><math>\left(\frac{3}{4}\right)</math></td> </tr> <tr> <td><math>2\frac{2}{9}</math></td> <td><math>2\frac{2}{5}</math></td> </tr> <tr> <td><math>5\frac{5}{6}</math></td> <td><math>7\frac{7}{20}</math></td> </tr> <tr> <td><math>1\frac{1}{30}</math></td> <td></td> </tr> </tbody> </table> <p>Four fractions correctly placed.</p> | Recurring decimals | Terminating decimals                                     | $\left(\frac{1}{3}\right)$ | $\left(\frac{3}{4}\right)$ | $2\frac{2}{9}$ | $2\frac{2}{5}$ | $5\frac{5}{6}$ | $7\frac{7}{20}$ | $1\frac{1}{30}$ |  | 2 | Award 2 marks if all fractions are in the correct column. |
| Recurring decimals         | Terminating decimals  |                    |  |                            |                            |                |                |                |                 |                 |  |   |   |
| $\left(\frac{1}{3}\right)$ | $\left(\frac{3}{4}\right)$  |                    |  |                            |                            |                |                |                |                 |                 |  |   |   |
| $2\frac{2}{9}$             | $2\frac{2}{5}$  |                    |  |                            |                            |                |                |                |                 |                 |  |   |   |
| $5\frac{5}{6}$             | $7\frac{7}{20}$   |                    |  |                            |                            |                |                |                |                 |                 |  |   |   |
| $1\frac{1}{30}$            |   |                    |  |                            |                            |                |                |                |                 |                 |  |   |   |
|                            |   | B1                 |  |                            |                            |                |                |                |                 |                 |  |   |   |
| 13                         | <p>4</p> $\begin{array}{r} 4 \\ -5 \\ \hline 8 \end{array}$ <p>Any two correct.</p>   | 2                  |  |                            |                            |                |                |                |                 |                 |  |   |   |
|                            |   | B1                 |  |                            |                            |                |                |                |                 |                 |  |   |   |

| Question        | Answer  | Marks             | Further Information   |                 |                  |   |  |
|-----------------|---|-------------------|---|-----------------|------------------|---|--|
| 14              | 6      8      9      36      64   | 1                 | Both answers must be ringed and no others for the award of the mark.<br>Accept any unambiguous indication of the correct answers. |                 |                  |   |  |
| Question        | Answer  | Marks             | Further Information   |                 |                  |   |  |
| 15              | (3, 5)  | 2                 |   |                 |                  |   |  |
|                 | One correct coordinate.   | B1                | Only award either B1 or M1  |                 |                  |   |  |
|                 | Correct intersection shown on grid.   | M1                |   |                 |                  |   |  |
| Question        | Answer  | Marks             | Further Information   |                 |                  |   |  |
| 16(a)           | <table border="1"> <thead> <tr> <th>Lily's estimate</th> <th>Jamila's estimate</th> </tr> </thead> <tbody> <tr> <td><math>\frac{31}{50}</math></td> <td><math>\frac{73}{100}</math></td> </tr> </tbody> </table>  | Lily's estimate   | Jamila's estimate   | $\frac{31}{50}$ | $\frac{73}{100}$ | 2 | Accept equivalent fractions, percentages or decimals, e.g.:<br>$\frac{62}{100}$ 62% 0.62<br>73% 0.73 |
|                 | Lily's estimate   | Jamila's estimate |   |                 |                  |   |  |
| $\frac{31}{50}$ | $\frac{73}{100}$  |                   |   |                 |                  |   |  |
|                 | One column correct.   | B1                |   |                 |                  |   |  |
| 16(b)           | <p>Ticks Jamila <b>and</b> gives a correct reason relating to the number of times they carried out the experiment, e.g.:</p> <ul style="list-style-type: none"> <li>Jamila has more results.</li> <li>Jamila opened twice as many packets of biscuits.</li> </ul> | 1                 | Do not allow just 'Jamila has 100.' oe<br>Note that the reason must make a comparison between Lily and Jamila's estimates.        |                 |                  |   |  |

| Question | Answer  | Marks | Further Information           |
|----------|---|-------|-------------------------------|
| 17       | 36  | 2     |                               |
|          | $5 \times 2^2 = 20$ (seen or implied) by $20 - 10$ .  | M1    |                               |
| Question | Answer  | Marks | Further Information           |
| 18(a)    | $2^0$   | 1     |                               |
| 18(b)    | $2^{-3}$  | 1     |                               |
| Question | Answer  | Marks | Further Information           |
| 19(a)    | A correct comment relating to the line for 65 years and above, for example: <ul style="list-style-type: none"> <li>The line for 65 years and above slopes up.</li> <li>There has been an increase in the percentage of people aged 65 and above.</li> </ul> | 1     |                               |
| 19(b)    | 1996  | 1     | Accept 1995 – 1997 inclusive. |
| Question | Answer  | Marks | Further Information           |
| 20       | 7   | 1     | Ignore units.                 |
| Question | Answer  | Marks | Further Information           |
| 21       | 7   | 1     |                               |
| Question | Answer  | Marks | Further Information           |
| 22       | 0   | 1     |                               |



| Question | Answer   | Marks | Further Information  |
|----------|--|-------|--|
| 23       | The 5 <sup>th</sup> and 6 <sup>th</sup> terms are 15 and 21<br>$15 + 21 (= 36) = 6^2$  | 2     | Accept $6^2$ or $6 \times 6$ or $\sqrt{36} = 6$ for indicating a square number, or '36 is a square number'.  |
|          | Finding 15 or 21 or 36   |       |  |
| Question | Answer   | Marks | Further Information  |
| 24       | 16   | 3     |  |
|          | $1 - (\frac{2}{5} + 35\%)$ correctly evaluated by converting $\frac{2}{5}$ and 35% to the same form to get 0.25, or equivalent (e.g. 25%, $\frac{1}{4}$ ). |       |  |
|          | Correct conversion of $\frac{2}{5}$ and 35% to the same form.  | M1    | For example: <ul style="list-style-type: none"> <li>0.4 and 0.35</li> <li>40% (and 35%)</li> <li><math>\frac{8}{20}</math> and <math>\frac{7}{20}</math> or equivalent fractions with equal denominators.</li> </ul> |
| Question | Answer   | Marks | Further Information  |
| 25(a)    | (m=) 19 (v)  | 1     | Do not accept 20 m = 380 v   |
| 25(b)    | 228 (g)  | 1     | Allow follow through from part (a), i.e. $12 \times \text{their } 19$  |

| Question | Answer   | Marks | Further Information   |
|----------|--|-------|---|
| 26       | $\frac{3}{2x}$   | 1     | Do not accept $\frac{2}{3x}$  |
| 27       | <p>Correct region, R:</p>   | 3     | Allow lack of label, R, if intended region is clear.  |
|          | <p>Both correct boundaries<br/> <b>or</b><br/>           1 correct boundary, 1 incorrect boundary with follow through correct region, provided the incorrect boundary is of the correct form i.e., arc or line.<br/> <b>or</b><br/>           1 correct boundary<br/> <b>or</b><br/>           2 incorrect boundaries with the correct form and correct follow through indication of the region.</p> | M2    | <p>Notes on correct form:</p> <ul style="list-style-type: none"> <li>• sight of an arc centre on the tree,</li> <li>• a vertical line inside the garden stretching at least as far as their arc.</li> </ul> |
|          |  | M1    |   |

| Question | Answer  | Marks | Further Information                              |
|----------|---|-------|--|
| 28       | Algebraic method seen leading to<br>( $m =$ ) 7<br>( $n =$ ) -2   | 3     | Do not accept trial and improvement as a method. |
|          | An algebraic method leading to either<br>$m = 7$ or $n = -2$  | M2    |  |
|          | An attempt at eliminating either $m$ or $n$<br>e.g. <ul style="list-style-type: none"> <li>• attempt to re-arrange one of the equations to make one variable the subject and then substitute their arrangement into the other equation,</li> <li>• attempt at making the coefficients of <math>m</math> or <math>n</math> equal with no more than 1 error, arithmetic or sign, followed by an appropriate, consistent subtraction or addition across <u>all</u> 3 terms.</li> <li>• correct substitution and evaluation from incorrect first value i.e. two values satisfying one of the original equations.</li> </ul> | M1    |  |

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