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# GCSE MATHEMATICS 8300/2F

Foundation Tier Paper 2 Calculator

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Mark scheme

November 2018

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Version: 1.1 Final



Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from [aqa.org.uk](http://aqa.org.uk)

## Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt.

|                        |  |
|------------------------|--|
| <b>M</b>               | Method marks are awarded for a correct method which could lead to a correct answer.  |
| <b>A</b>               | Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied. |
| <b>B</b>               | Marks awarded independent of method.   |
| <b>ft</b>              | Follow through marks. Marks awarded for correct working following a mistake in an earlier step.  |
| <b>SC</b>              | Special case. Marks awarded for a common misinterpretation which has some mathematical worth.  |
| <b>M dep</b>           | A method mark dependent on a previous method mark being awarded.   |
| <b>B dep</b>           | A mark that can only be awarded if a previous independent mark has been awarded.   |
| <b>oe</b>              | Or equivalent. Accept answers that are equivalent.<br>eg accept 0.5 as well as $\frac{1}{2}$   |
| <b>[a, b]</b>          | Accept values between a and b inclusive.   |
| <b>[a, b)</b>          | Accept values $a \leq \text{value} < b$  |
| <b>3.14 ...</b>        | Accept answers which begin 3.14 eg 3.14, 3.142, 3.1416   |
| <b>Use of brackets</b> | It is not necessary to see the bracketed work to award the marks.  |

Examiners should consistently apply the following principles

### **Diagrams**

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

### **Responses which appear to come from incorrect methods**

Whenever there is doubt as to whether a student has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the student. In cases where there is no doubt that the answer has come from incorrect working then the student should be penalised.

### **Questions which ask students to show working**

Instructions on marking will be given but usually marks are not awarded to students who show no working.

### **Questions which do not ask students to show working**

As a general principle, a correct response is awarded full marks.

### **Misread or miscopy**

Students often copy values from a question incorrectly. If the examiner thinks that the student has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

### **Further work**

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

### **Choice**

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

### **Work not replaced**

Erased or crossed out work that is still legible should be marked.

### **Work replaced**

Erased or crossed out work that has been replaced is not awarded marks.

### **Premature approximation**

Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

### **Continental notation**

Accept a comma used instead of a decimal point (for example, in measurements or currency), provided that it is clear to the examiner that the student intended it to be a decimal point.

| Question | Answer | Mark | Comments |
|----------|--------|------|----------|
|----------|--------|------|----------|

|          |                            |    |  |
|----------|----------------------------|----|--|
| <b>1</b> | 24 cm                      | B1 |  |
|          | <b>Additional Guidance</b> |    |  |
|          |                            |    |  |

|          |                            |    |  |
|----------|----------------------------|----|--|
| <b>2</b> | -0.89                      | B1 |  |
|          | <b>Additional Guidance</b> |    |  |
|          |                            |    |  |

|          |                            |    |  |
|----------|----------------------------|----|--|
| <b>3</b> | $14x - 3$                  | B1 |  |
|          | <b>Additional Guidance</b> |    |  |
|          |                            |    |  |

|          |                            |    |  |
|----------|----------------------------|----|--|
| <b>4</b> | $225^\circ$                | B1 |  |
|          | <b>Additional Guidance</b> |    |  |
|          |                            |    |  |

|                                    |   |    |                      |
|------------------------------------|---|----|----------------------|
| <b>5</b>                           | <b>Alternative method 1</b>               |    |                      |
|                                    | $37 \times 0.25$ or 9.25                  | M1 | must be working in £ |
|                                    | 312.65                                    | A1 | condone £312.65p     |
|                                    | <b>Alternative method 2</b>               |    |                      |
|                                    | $303.4 \div 37 + 0.25$ or 8.45            | M1 | must be working in £ |
|                                    | 312.65                                    | A1 | condone £312.65p     |
|                                    | <b>Additional Guidance</b>                |    |                      |
|                                    | Working in pence must be recovered        |    |                      |
|                                    | eg1 $37 \times 25 = 925$                  |    | M0                   |
|                                    | eg2 $37 \times 25 = 925$ and used as 9.25 |    | M1                   |
| eg3 $8.20 + 25 = 33.20$            |   | M0 |                      |
| eg4 $8.20 + 25 = 8.45$             |   | M1 |                      |
| Do not accept 7 as a misread of 37 |   | M0 |                      |

| Question | Answer | Mark | Comments |
|----------|--------|------|----------|
|----------|--------|------|----------|

| <b>6(a)</b>   | 884.79   | B1               |  |          |             |           |          |            |          |                  |  |  |         |          |             |  |        |        |          |          |  |       |        |          |        |         |  |         |           |
|---|--|------------------|--|----------|-------------|-----------|----------|------------|----------|------------------|--|--|---------|----------|-------------|--|--------|--------|----------|----------|--|-------|--------|----------|--------|---------|--|---------|-----------|
|   | 797.48   | B1ft             | ft their 884.79 – 87.31                                |          |             |           |          |            |          |                  |  |  |         |          |             |  |        |        |          |          |  |       |        |          |        |         |  |         |           |
|   | 2867.23  | B1ft             | ft their 797.48 + 2069.75<br>or their 884.79 + 1982.44 |          |             |           |          |            |          |                  |  |  |         |          |             |  |        |        |          |          |  |       |        |          |        |         |  |         |           |
|   | <b>Additional Guidance</b>   |                  |  |          |             |           |          |            |          |                  |  |  |         |          |             |  |        |        |          |          |  |       |        |          |        |         |  |         |           |
|   | <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #e0e0e0;"> <th style="width: 15%;">Date</th> <th style="width: 25%;">Description</th> <th style="width: 15%;">Credit(£)</th> <th style="width: 15%;">Debit(£)</th> <th style="width: 30%;">Balance(£)</th> </tr> </thead> <tbody> <tr> <td>01/09/18</td> <td>Starting balance</td> <td></td> <td></td> <td>1140.79</td> </tr> <tr> <td>06/09/18</td> <td>Car repairs</td> <td></td> <td>256.00</td> <td>884.79</td> </tr> <tr> <td>17/09/18</td> <td>Gas bill</td> <td></td> <td>87.31</td> <td>797.48</td> </tr> <tr> <td>24/09/18</td> <td>Salary</td> <td>2069.75</td> <td></td> <td>2867.23</td> </tr> </tbody> </table> |                  |  | Date     | Description | Credit(£) | Debit(£) | Balance(£) | 01/09/18 | Starting balance |  |  | 1140.79 | 06/09/18 | Car repairs |  | 256.00 | 884.79 | 17/09/18 | Gas bill |  | 87.31 | 797.48 | 24/09/18 | Salary | 2069.75 |  | 2867.23 | <b>B3</b> |
|   | Date   | Description      | Credit(£)  | Debit(£) | Balance(£)  |           |          |            |          |                  |  |  |         |          |             |  |        |        |          |          |  |       |        |          |        |         |  |         |           |
|   | 01/09/18   | Starting balance |  |          | 1140.79     |           |          |            |          |                  |  |  |         |          |             |  |        |        |          |          |  |       |        |          |        |         |  |         |           |
|   | 06/09/18   | Car repairs      |  | 256.00   | 884.79      |           |          |            |          |                  |  |  |         |          |             |  |        |        |          |          |  |       |        |          |        |         |  |         |           |
|   | 17/09/18   | Gas bill         |  | 87.31    | 797.48      |           |          |            |          |                  |  |  |         |          |             |  |        |        |          |          |  |       |        |          |        |         |  |         |           |
|   | 24/09/18   | Salary           | 2069.75  |          | 2867.23     |           |          |            |          |                  |  |  |         |          |             |  |        |        |          |          |  |       |        |          |        |         |  |         |           |
|   | Condone £ signs and/ or p  |                  |  |          |             |           |          |            |          |                  |  |  |         |          |             |  |        |        |          |          |  |       |        |          |        |         |  |         |           |
|   | Ignore working in shaded cells   |                  |  |          |             |           |          |            |          |                  |  |  |         |          |             |  |        |        |          |          |  |       |        |          |        |         |  |         |           |
| Do not accept 2.867.23 for the final value                                      |  |                  |  |          |             |           |          |            |          |                  |  |  |         |          |             |  |        |        |          |          |  |       |        |          |        |         |  |         |           |
| Mark the table but be aware of possible transcription errors from other working |  |                  |  |          |             |           |          |            |          |                  |  |  |         |          |             |  |        |        |          |          |  |       |        |          |        |         |  |         |           |
| Only cell completed is the final one with 2867.23                               |  |                  | <b>B0B0B1</b>  |          |             |           |          |            |          |                  |  |  |         |          |             |  |        |        |          |          |  |       |        |          |        |         |  |         |           |

| Question | Answer | Mark | Comments |
|----------|--------|------|----------|
|----------|--------|------|----------|

|   |  |    |                                 |
|---|--|----|---------------------------------|
| <b>6(b)</b>   | Correct definition<br>eg<br>money that comes out of your account<br>an amount that comes off your balance<br>something that you've paid  | B1 | accept<br>(amount you) subtract |
|   | <b>Additional Guidance</b>   |    |                                 |
|   | Do not accept a correct response with an incorrect response but you can ignore any description of credit alongside a correct response  |    |                                 |
|   | Money spent / paid / deducted / subtracted / going out / withdrawn   |    | B1                              |
|   | Comes out of your account / comes off balance / comes out of the bank  |    | B1                              |
|   | Condone description of direct debit<br>eg amount paid regularly / money withdrawn monthly / paid out each month / paid frequently / money that needs to be paid / money you will have to pay |    | B1                              |
|   | Do not accept description of debt or use of the word 'owe'<br>eg something that you owe, money owed for bills, what you owe the bank, how much you spent on debt                             |    | B0                              |
|   | Do not accept description of cost or discount<br>eg how much it costs, something that is taken off the price, money taken off the cost   |    | B0                              |
| Other unacceptable answers are<br>eg spending money on a card directly from your bank, borrowed from the bank, your own money that is not borrowed, monthly charge, loss of money |  | B0 |                                 |

|             |   |    |    |
|-------------|---|----|----|
| <b>7(a)</b> | (3, 3.5) or $(3, 3\frac{1}{2})$             | B1 |    |
|             | <b>Additional Guidance</b>                  |    |    |
|             | A comma used as a decimal point ie (3, 3,5) |    | B1 |
|             | (03, 03.5)                                  |    | B1 |
|             | (0,3, 0,3.5)                                |    | B0 |

| Question | Answer | Mark | Comments |
|----------|--------|------|----------|
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|             |                            |    |    |
|-------------|----------------------------|----|----|
| <b>7(b)</b> | (4, 4)                     | B1 |    |
|             | <b>Additional Guidance</b> |    |    |
|             | (04, 04)                   |    | B1 |
|             | (0,4, 0,4)                 |    | B0 |

|             |   |    |  |
|-------------|---|----|--|
| <b>7(c)</b> | Line from (0, 0) to (4, 2)  | B2 | B1 line from (0, 0) to (4, 2) with slight inaccuracy<br>or<br>line parallel to <i>AB</i> from any point which extends across at least two horizontal squares |
|             | <b>Additional Guidance</b>  |    |  |
|             | Parallel line that extends beyond the grid  |    | B1   |
|             | Line drawn that is completely off the grid  |    | B0   |
|             | Use the full length of the line to judge accuracy – there should be no gap between their line and the relevant integer points |    |  |
|             | Mark intention for straightness   |    |  |
|             | Ignore other lines that could be working for parts (a) and (b)  |    |  |

|             |  |    |  |
|-------------|--|----|--|
| <b>8(a)</b> | R S T B<br>R S B T<br>R T S B<br>R T B S<br>R B S T<br>R B T S | B2 | may be presented vertically<br>B1 4 or 5 correct orders and 0, 1 or 2 incorrect orders<br>or<br>the 6 correct orders and 1 or 2 incorrect orders<br>or<br>24 possible orders with R in any place<br>or<br>STB, SBT, TSB, TBS, BTS, BST |
|             | <b>Additional Guidance</b>                                     |    |  |
|             | Correct orders start with R                                    |    |  |
|             | Ignore repeated orders for both marks                          |    |  |



| Question | Answer | Mark | Comments |
|----------|--------|------|----------|
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|             |   |       |  |
|-------------|---|-------|--|
| <b>8(b)</b> | <b>Alternative method 1</b>   |       |  |
|             | 1.50 + 15 (mins)<br>or<br>13.50 + 15 (mins)<br>or<br>2.05 (pm) or 14.05 as end of rowing machine<br>or<br>2.09 (pm) or 14.09 as start of second piece of equipment  | M1    | oe<br>condone starting on a different piece of equipment if equipment clearly stated   |
|             | their 2.05 (pm) + 4 (mins) + 13 (mins) + 4 (mins) + 35 (mins) + 4 (mins) + 1 (hour) 30 (mins)<br>or<br>their 2.09 (pm) + 13 (mins) + 4 (mins) + 35 (mins) + 4 (mins) + 1 (hour) 30 (mins)   | M1dep | oe eg their 2.09 (pm) + 17 (mins) + 39 (mins) + 1 (hour) 30 (mins)<br>calculation(s) shown that would lead to 4.35 if evaluated correctly            |
|             | 4.35 (pm) or 16.35  | A1    | SC2 4.39 (pm) or 16.39 from 4 breaks   |
|             | <b>Alternative method 2</b>   |       |  |
|             | 15 (mins) + 13 (mins) + 35 (mins) + 1 (hour) 30 (mins)<br>or 2 (hours) 33 (mins) or 153 (mins)<br>or<br>15 (mins) + 4 (mins) + 13 (mins) + 4 (mins) + 35 (mins) + 4 (mins) + 1 (hour) 30 (mins)<br>or 2 (hours) 45 (mins) or 165 (mins) | M1    | oe eg 19 + 17 + 39 + 1 h 30<br>implied by 4.23 (pm) or 16.23<br>condone 2.33 or 2.45   |
|             | 1.50 (pm) + their 2 (hours) 33 (mins) + 3 × 4 (mins)<br>or<br>1.50 (pm) + their 2 (hours) 45 (mins)<br>or<br>4.23 (pm) + 3 × 4 (mins)   | M1dep | oe<br>their 153 or their 165 must be correctly converted to hours and minutes<br>calculation(s) shown that would lead to 4.35 if evaluated correctly |
|             | 4.35 (pm) or 16.35  | A1    | SC2 4.39 (pm) or 16.39 from 4 breaks   |

**Additional Guidance continued on the next page**

| Question | Answer | Mark | Comments |
|----------|--------|------|----------|
|----------|--------|------|----------|

|              |   | Additional Guidance |      |      |      |      |      |   |
|--------------|---|---------------------|------|------|------|------|------|---|
|              |   |                     | RSTB | RSBT | RTSB | RTBS | RBST | RBTS                                      |
|              | End 1st   | 2.05                | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05                                      |
|              | Start 2nd   | 2.09                | 2.09 | 2.09 | 2.09 | 2.09 | 2.09 | 2.09                                      |
|              | End 2nd   | 2.22                | 2.22 | 2.44 | 2.44 | 3.39 | 3.39 | 3.39                                      |
|              | Start 3rd   | 2.26                | 2.26 | 2.48 | 2.48 | 3.43 | 3.43 | 3.43                                      |
|              | End 3rd   | 3.01                | 3.56 | 3.01 | 4.18 | 3.56 | 4.18 | 4.18                                      |
|              | Start 4th   | 3.05                | 4.00 | 3.05 | 4.22 | 4.00 | 4.22 | 4.22                                      |
|              | End 4th   | 4.35                | 4.35 | 4.35 | 4.35 | 4.35 | 4.35 | 4.35                                      |
| 8(b)<br>cont | Having 0, 1 or 2 breaks will score a maximum of M1  |                     |      |      |      |      |      |   |
|              | Having 4 breaks may score the special case if evaluated correctly   |                     |      |      |      |      |      |   |
|              | Condone using decimal time for a maximum of M1 (unless recovered)<br>eg1 in alt 2, $0.15 + 0.13 + 0.35 + 1.3 = 2 \text{ h } 33 \text{ min}$ (recovered)<br>eg2 in alt 2, $0.15 + 0.13 + 0.35 + 1.3 (= 1.93)$<br>eg3 in alt 1, $1.5 + 15 = 1.65$<br>eg4 in alt 1, $2.26 \text{ pm} + 90 = 3.16 \text{ pm}$ (has added 0.9)                     |                     |      |      |      |      |      | at least M1<br>max M1<br>max M1<br>max M1 |
|              | Condone 16.35pm   |                     |      |      |      |      |      |   |
|              | May work in 24-hour clock throughout  |                     |      |      |      |      |      |   |
|              | Times may just be listed as in the table in the AG but if an error is made they must have shown the amount of time intended to be added<br>eg1 2.09, 2.22, 2.26, 3.02, 3.06, 4.36<br>(error seen at 3.01, time not shown)<br>eg2 2.09, 13 mins, 2.22, 2.26, 35 mins, 3.02, 3.06, 4.36<br>(error seen at 3.01 but intention to add 35 implied) |                     |      |      |      |      |      | M1M0<br><br>M1M1                          |
|              | 4.35 seen, answer 4 h 35 min  |                     |      |      |      |      |      | M2A0                                      |

| Question | Answer | Mark | Comments |
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|             |  |    |  |
|-------------|--|----|--|
| <b>9(a)</b> | All composite bars with correct widths and heights as<br>Tuesday      8 and 6<br>Wednesday 10 and 3<br>Thursday      6 and 6<br>Friday          12 and 4 | B2 | B1 one composite bar correct<br>or<br>all four email sections correct at the bottom of composite bars<br>or<br>all four text sections correct at the top of composite bars<br>or<br>four bars with total heights 14, 13, 12 and 16 (no or incorrect divisions)<br>or<br>widths different but all four composite bars correct |
|             | <b>Additional Guidance</b>   |    |  |
|             | Bars drawn freehand with clear intention of correct widths and heights   |    | B2   |
|             | Mark intention for heights but Wednesday height must be [6.4, 6.6] cm  |    |  |
|             | Condone incorrect shading or lack of shading   |    |  |

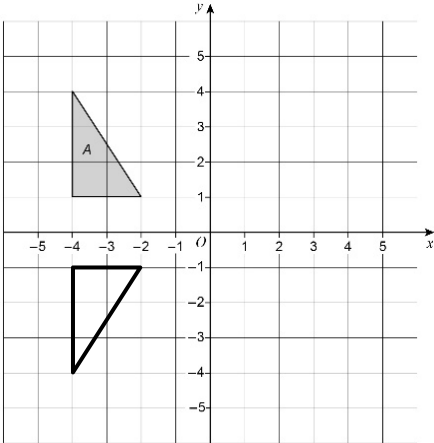
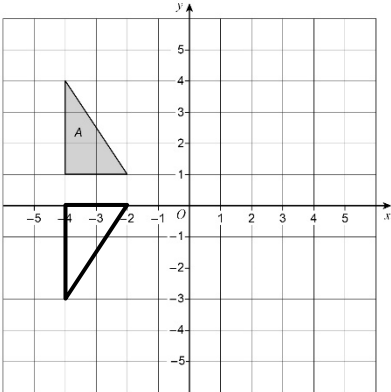
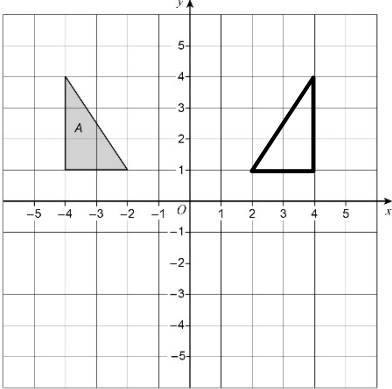
|                                      |   |      |  |
|--------------------------------------|---|------|--|
| <b>9(b)</b>                          | 12 + 8 + 10 + 6 + 12 or 48<br>or<br>5 + 6 + 3 + 6 + 4 or 24<br>or<br>12 + 8 + 10 + 6 + 12 + 5 + 6 + 3 + 6 + 4 or 72 | M1   | may be seen near table<br>addition may be implied by a total at the bottom of a column   |
|                                      | $\frac{48}{72}$   | A1   | oe fraction  |
|                                      | $\frac{2}{3}$   | A1ft | ft M1A0 with their fraction < 1 seen, if it can be simplified and it is fully simplified |
|                                      | <b>Additional Guidance</b>  |      |  |
|                                      | $\frac{2}{3}$ changed to decimal or percentage  |      | M1A1A0   |
| Do not allow misreads from the table |   |      |  |

| Question | Answer | Mark | Comments |
|----------|--------|------|----------|
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|           |                            |    |  |
|-----------|----------------------------|----|--|
| <b>10</b> | × 3                        | B1 |  |
|           | <b>Additional Guidance</b> |    |  |
|           |                            |    |  |

|                            |  |                             |                                  |           |      |          |      |                 |  |
|----------------------------|--|-----------------------------|----------------------------------|-----------|------|----------|------|-----------------|--|
| <b>11(a)</b>               | Correct values and units   | B3                          | B2                               |           |      |          |      |                 |  |
|                            | <table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Flour</td> <td style="padding: 2px;">180 grams</td> </tr> <tr> <td style="padding: 2px;">Eggs</td> <td style="padding: 2px;">3 (eggs)</td> </tr> <tr> <td style="padding: 2px;">Milk</td> <td style="padding: 2px;">315 millilitres</td> </tr> </table> |                             | Flour                            | 180 grams | Eggs | 3 (eggs) | Milk | 315 millilitres | two or three correct values (ignore units) |
|                            | Flour  |                             | 180 grams                        |           |      |          |      |                 |  |
|                            | Eggs   | 3 (eggs)                    |                                  |           |      |          |      |                 |  |
|                            | Milk   | 315 millilitres             |                                  |           |      |          |      |                 |  |
|                            |  | B1                          | one correct value (ignore units) |           |      |          |      |                 |  |
|                            |  |                             | or                               |           |      |          |      |                 |  |
|                            |  |                             | 9 ÷ 6 or 1.5 seen                |           |      |          |      |                 |  |
|                            |  | or                          |                                  |           |      |          |      |                 |  |
|                            |  | 6 ÷ 9 or $\frac{2}{3}$ seen |                                  |           |      |          |      |                 |  |
| <b>Additional Guidance</b> |  |                             |                                  |           |      |          |      |                 |  |
|                            | Only accept abbreviated units as g and ml  |                             |                                  |           |      |          |      |                 |  |
|                            | Accept incorrect spelling of units if intention is clear   |                             |                                  |           |      |          |      |                 |  |
|                            | Mark the table unless looking for a scale factor for B1  |                             |                                  |           |      |          |      |                 |  |
|                            | Allow 3 in the table even if eg $2 \div 6 (= 0.3) \times 9 = 2.7$ seen in the working  |                             |                                  |           |      |          |      |                 |  |
|                            | Do not allow eg 2.7 in the table or a choice of eg 2.7 and 3 in the table  |                             |                                  |           |      |          |      |                 |  |

|              |                            |    |      |
|--------------|----------------------------|----|------|
| <b>11(b)</b> | 210 ÷ 28.4 or 7.39...      | M1 |      |
|              | 7.4                        | A1 |      |
|              | <b>Additional Guidance</b> |    |      |
|              | Only 7.4 seen              |    | M1A1 |
|              | Only 7.3 seen              |    | M0A0 |
|              | 7.40                       |    | A0   |

| Question | Answer  | Mark | Comments   |  |
|----------|---|------|--|--|
| 12       |  | B2   | <p>B1 reflection in any horizontal line<br/>eg</p>  <p>or reflection in <math>y</math>-axis<br/>ie</p>  <p>or <math>(-4, -1)</math>, <math>(-4, -4)</math> and <math>(-2, -1)</math> plotted<br/>with no incorrect points</p> |  |
|          | <b>Additional Guidance</b>  |      |  |  |
|          | Mark intention  |      |  |  |

| Question | Answer | Mark | Comments |
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|              |  |       |  |
|--------------|--|-------|--|
| <b>13(a)</b> | <b>Alternative method 1</b>                  |       |  |
|              | 3000 ÷ 2 or 1500                             | M1    | oe   |
|              | their 1500 × 8.6(0) or 12 900                | M1dep | oe   |
|              | their 1500 ÷ 3 or 500                        | M1dep | oe condone 1500 × 0.3(...) oe<br>dep on 1st mark |
|              | their 500 × 8.6(0) × 0.25 or 1075            | M1dep | oe   |
|              | their 12 900 + their 1075                    | M1dep | dep on 2nd and 4th mark                          |
|              | 13 975                                       | A1    | accept 14 000 with working                       |
|              | <b>Alternative method 2</b>                  |       |  |
|              | 3000 ÷ 2 or 1500                             | M1    | oe   |
|              | their 1500 ÷ 3 or 500                        | M1dep | oe condone 1500 × 0.3(...) oe                    |
|              | (their 1500 – their 500) × 8.6(0)<br>or 8600 | M1dep | oe   |
|              | their 500 × 8.6(0) × 1.25 or 5375            | M1dep | oe<br>dep on 2nd mark                            |
|              | their 8600 + their 5375                      | M1dep | dep on 3rd and 4th mark                          |
|              | 13 975                                       | A1    | accept 14 000 with working                       |
|              | <b>Alternative method 3</b>                  |       |  |
|              | 3000 ÷ 2 or 1500                             | M1    | oe   |
|              | their 1500 × 8.6(0) or 12 900                | M1dep | oe   |
|              | their 12 900 ÷ 3<br>or 12 900 and 4300       | M1dep | oe condone 12 900 × 0.3(...) oe                  |
|              | their 4300 × 0.25 or 1075                    | M1dep | oe   |
|              | their 12 900 + their 1075                    | M1dep |  |
|              | 13 975                                       | A1    | accept 14 000 with working                       |

**Additional Guidance continued on the next page**

| Question | Answer | Mark | Comments |
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| <b>Additional Guidance</b> |   |
|----------------------------|---|
| <b>13(a)<br/>cont</b>      | Dependent marks are dep on previous mark unless otherwise stated      |
|                            | Use the scheme that awards the most marks and ignore choice           |
|                            | Build-up attempts for 25% must show full working or correct values    |
|                            | 1075 and 12 900 or 5375 and 8600 (unless added)                       |
|                            | 1075 <b>without</b> 12 900 implies 1st, 3rd and 4th marks in Alt 1    |
|                            | 5375 <b>without</b> 8600 implies 1st, 2nd and 4th marks in Alt 2      |
|                            | 8600 implies 1st, 2nd and 3rd marks in Alt 2                          |
|                            | 12 900 implies 1st and 2nd marks in Alt 1 and Alt 3                   |
|                            | 500 implies 1st and 3rd marks in Alt 1 and 1st and 2nd marks in Alt 2 |
|                            | £13975p   |
|                            | £13975.00p  |

| Question | Answer | Mark | Comments |
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|                                 |  |    |  |
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| <b>13(b)</b>                    | Ticks 'It should be higher' with correct reason  | B1 | eg<br>the 25% will be on a higher amount<br>the government will pay more |
|                                 | <b>Additional Guidance</b>   |    |  |
|                                 | Must tick the correct box or, if the boxes are all blank, state that it will be higher   |    |  |
|                                 | Must refer to the 25% being on a larger amount or the increase in the government's contribution  |    |  |
|                                 | 25% of more is more  |    | B1   |
|                                 | The 25% will be more (condone)   |    | B1   |
|                                 | The £2.15 will be more   |    | B1   |
|                                 | Government would have paid more tax (condone)  |    | B1   |
|                                 | Do not accept any suggestion that the overall average has increased or a repeat of the information that the people with a tax form paid more |    |  |
|                                 | The people who filled in a tax form paid more  |    | B0   |
|                                 | The donations from the tax form people have increased  |    | B0   |
|                                 | The average has increased  |    | B0   |
|                                 | Tax is usually an increase   |    | B0   |
|                                 | It's higher so they receive more   |    | B0   |
| Because the government adds 25% |  | B0 |  |



| Question | Answer | Mark | Comments |
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| <b>14</b> | The graph only goes from $x = -4$ to $x = 4$<br>and<br>the graph shown is $y = -x$ up to 0   | B2 | oe<br>B1 one correct criticism<br>SC1 correct graph drawn from $x = -5$ to $x = 5$ |
|           | <b>Additional Guidance</b>   |    |  |
|           | For one criticism, accept eg<br>it doesn't reach 5 / 5 not plotted / it doesn't start at -5<br>only starts at -4 / only reaches 4<br>it should go to (5, 5) / (5, 5) not plotted / (-5, -5) not plotted<br>it isn't long enough  |    | B1   |
|           | Do not accept eg<br>it isn't finished<br>(-5, 5) not plotted   |    | B0   |
|           | For the other criticism, accept eg<br>it's the wrong line up to 0<br>it's the wrong equation for the first part<br>$y$ does not equal $x$ at the beginning<br>it should go through (-4, -4) / (-5, -5) not plotted / (-1, -1) should be plotted<br>it should be / it's not a straight line<br>it shouldn't be a V-shape<br>worked out the negative numbers wrong / no negative $y$ -coordinates<br>he should have plotted ... <b>and</b> correct table of values |    | B1   |
|           | Do not accept eg<br>it isn't correctly drawn / it isn't $y = x$ / the points are plotted wrong<br>it should be symmetrical / it shouldn't be symmetrical<br>one line should go below the $x$ -axis   |    | B0   |
|           | <b>NB</b> (-5, -5) should be plotted is valid for either (but not both) criticisms   |    | B1   |
|           | Both criticisms may be in one answer space   |    |  |
|           | Ignore irrelevant statements but any additional statements must be correct eg It goes from -4 to 5 not -5 to 5   |    | B0   |

| Question | Answer | Mark | Comments |
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|              |  |       |  |
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| <b>15(a)</b> | <b>Alternative method 1</b>  |       |  |
|              | $1.8(0) \times 8$ or $14.4(0)$   | M1    | implied by $5.6(0)$ or $18.4(0)$           |
|              | $20 - \text{their } 14.4(0) - 4$<br>or $20 - 18.4(0)$ or $1.6$                         | M1dep |  |
|              | $1.60$   | A1    | condone $\pounds 1.60\text{p}$             |
|              | <b>Alternative method 2</b>  |       |  |
|              | $b = A - 4 - 1.8m$   | M1    | oe correct formula with $b$ as the subject |
|              | $20 - 4 - 1.8(0) \times 8$ or $1.6$  | M1dep |  |
|              | $1.60$   | A1    | condone $\pounds 1.60\text{p}$             |
|              | <b>Additional Guidance</b>   |       |  |
|              | $1.8(0) \times 8$ may be within an incorrect calculation eg $4 + 1.8(0) \times 8 + 20$ |       | M1   |

|   |  |    |   |
|---|--|----|---|
| <b>15(b)</b>  | $C = 3 + 1.9(0)m$  | B1 | oe formula with $C$ as subject<br>accept $C = 3 + 1.9(0) \times m$<br>condone $+ 0$ or $+ 0b$ |
|   | <b>Additional Guidance</b>   |    |   |
|   | $3 + 1.9m$   |    | B0  |
|   | Do not accept eg $A = \dots$ for $C = \dots$                               |    | B0  |
|   | Allow $m$ to be $\times$ mile(s) but not a different letter unless defined |    |   |
|   | eg1 $C = 3 + 1.9(0) \times \text{miles}$                                   |    | B1  |
|   | eg2 $C = 3 + 1.9(0) \text{ miles}$   |    | B0  |
|   | eg3 $C = 3 + 1.9(0) \text{ per mile}$ or $C = 3 + 1.9(0)\text{pm}$         |    | B0  |
| eg4 $C = 3 + 1.9(0)x$   |  | B0 |   |
| Ignore $\pounds$ inserted in part or all of equation eg $C = 3 + \pounds 1.90m$ |  | B1 |   |
| Correct formula followed by substitution (and evaluation)                       |  | B1 |   |

| Question | Answer | Mark | Comments |
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| <b>16</b> | A and B                    | B1 |  |
|           | <b>Additional Guidance</b> |    |  |
|           |                            |    |  |

|           |   |    |                                       |
|-----------|---|----|---------------------------------------|
| <b>17</b> | Pi or $\pi$   | B1 | accept a value in range [3.14, 3.142] |
|           | <b>Additional Guidance</b>                                    |    |                                       |
|           | Accept incorrect spelling if intention is clear eg accept pie |    |                                       |
|           | Answer ( $C =$ ) $\pi d$                                      |    | B0                                    |
|           | Answer ( $C =$ ) $\pi d$ ( $k =$ ) $\pi$                      |    | B1                                    |

|              |  |    |    |
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| <b>18(a)</b> | 8  | B1 |    |
|              | <b>Additional Guidance</b>   |    |    |
|              | Ignore mention of bulls or cows eg condone 8 cows                                    |    | B1 |
|              | Condone an answer of 8 : 240   |    | B1 |
|              | 8 : 240 followed by 1 : 30   |    | B0 |
|              | 8 : 30   |    | B0 |
|              | Do not accept 8 from an incorrect method<br>eg $240 \div 31 = 7.7\dots$ and answer 8 |    | B0 |

| Question | Answer | Mark | Comments |
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| 18(b) | <b>Alternative method 1</b>   |       |   |
|       | $[28, 31] \times 10$ or $[280, 310]$  | M1    | appropriate days in 10-month year   |
|       | their $[280, 310] \times 25$<br>or $[7000, 7750]$<br>or<br>their $[280, 310] \times 240$<br>or $[67\,200, 74\,400]$                           | M1dep | litres per year per cow<br><br>milkings per year for 240 cows   |
|       | their $[7000, 7750] \times 240$<br>or<br>their $[67\,200, 74\,400] \times 25$   | M1dep |   |
|       | $[1\,680\,000, 1\,860\,000]$ with correct working   | A1    | accept to 1 or 2 sf with correct working<br>SC2 answer of $[2\,016\,000, 2\,232\,000]$<br>with the only error using 12 months and working shown |
|       | <b>Alternative method 2</b>   |       |   |
|       | $25 \times 240$ or 6000   | M1    | litres per day for 240 cows<br>may be seen embedded in a <b>product</b><br>eg $25 \times 10 \times 240$   |
|       | their $6000 \times [28, 31]$<br>or $[168\,000, 186\,000]$<br>or<br>$25 \times 240$ or 6000 <b>and</b><br>$[28, 31] \times 10$ or $[280, 310]$ | M1dep | litres per month for 240 cows<br><br>litres per day for 240 cows <b>and</b><br>appropriate days in 10-month year                                |
|       | their $[168\,000, 186\,000] \times 10$<br>or<br>$25 \times 240 \times [28, 31] \times 10$<br>or<br>their $6000 \times$ their $[280, 310]$     | M1dep |   |
|       | $[1\,680\,000, 1\,860\,000]$ with correct working   | A1    | accept to 1 or 2 sf with correct working<br>SC2 answer of $[2\,016\,000, 2\,232\,000]$<br>with the only error using 12 months and working shown |

**Alternative methods and Additional Guidance continued on the next two pages**

| Question | Answer | Mark | Comments |
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|                       |  |       |   |
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| <b>18(b)<br/>cont</b> | <b>Alternative method 3</b>  |       |   |
|                       | [28, 31] × 25 or [700, 775]  | M1    | litres per month per cow  |
|                       | their [700, 775] × 10<br>or [7000, 7750]<br>or<br>their [700, 775] × 240<br>or [168 000, 186 000]        | M1dep | litres per year per cow<br><br>litres per month for 240 cows  |
|                       | their [7000, 7750] × 240<br>or<br>their [168 000, 186 000] × 10  | M1dep |   |
|                       | [1 680 000, 1 860 000] with correct working  | A1    | accept to 1 or 2 sf with correct working<br>SC2 answer of [2 016 000, 2 232 000]<br>with the only error using 12 months and working shown |
|                       | <b>Alternative method 4</b>  |       |   |
|                       | [28, 31] × 240 or [6720, 7440]   | M1    | milking per month for 240 cows  |
|                       | their [6720, 7440] × 10<br>or [67 200, 74 400]<br>or<br>their [6720, 7440] × 25<br>or [168 000, 186 000] | M1dep | milking per year for 240 cows<br><br>litres per month for 240 cows  |
|                       | their [67 200, 74 400] × 25<br>or<br>their [168 000, 186 000] × 10                                       | M1dep |   |
|                       | [1 680 000, 1 860 000] with correct working  | A1    | accept to 1 or 2 sf with correct working<br>SC2 answer of [2 016 000, 2 232 000]<br>with the only error using 12 months and working shown |

**Additional Guidance continued on the next page**

| Question | Answer | Mark | Comments |
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| <b>Additional Guidance</b> |   |      |  |
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| <b>18b<br/>cont</b>        | Use the scheme that awards the most marks and ignore choice   |      |  |
|                            | A value in the range [280, 310] may come from subtracting two months from a year<br>eg uses 303 (may come from $365 - 31 - 31$ )  | M1   |  |
|                            | The special case allows 2 marks for those using 12 months or using [336, 372] days  |      |  |
|                            | Allow <b>consistent</b> use of approximations to 1 sf throughout (this leads to an answer in the given range)<br>ie $30 \times 10 \times 30 \times 200 = 1\,800\,000$   | M3A1 |  |
|                            | Mark inconsistent use of approximations to 1sf as the scheme  |      |  |
|                            | Their final answer must be in range and correct for their product but may be given to 1 or 2 sf   |      |  |
|                            | eg<br>280 days: $28 \times 10 \times 25 \times 240 = 1\,680\,000$<br>300 days: $30 \times 10 \times 25 \times 240 = 1\,800\,000$<br>310 days: $31 \times 10 \times 25 \times 240 = 1\,860\,000$<br>303 days: $303 \times 25 \times 240 = 1\,818\,000$<br>304 days: $304 \times 25 \times 240 = 1\,824\,000$<br>305 days: $305 \times 25 \times 240 = 1\,830\,000$ | M3A1 |  |
|                            | eg<br>12 months of 28 days: $28 \times 12 \times 25 \times 240 = 2\,016\,000$<br>12 months of 30 days: $30 \times 12 \times 25 \times 240 = 2\,160\,000$<br>12 months of 31 days: $31 \times 12 \times 25 \times 240 = 2\,232\,000$<br>365 days: $365 \times 25 \times 240 = 2\,190\,000$<br>366 days: $366 \times 25 \times 240 = 2\,196\,000$                   | SC2  |  |

| Question | Answer | Mark | Comments |
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| 19  | <b>Alternative method 1</b>   |    |  |
|   | $7.2^2 + 9.6^2 (= 51.84 + 92.16) = 144$<br>and<br>$\sqrt{144} = 12$ or $12^2 = 144$                   | B2 | B1 $7.2^2$ and $9.6^2$ oe  |
|   | <b>Alternative method 2</b>   |    |  |
|   | $12^2 - 7.2^2 (= 144 - 51.84) = 92.16$<br>and<br>$\sqrt{92.16} = 9.6$ or $9.6^2 = 92.16$              | B2 | B1 $12^2$ and $7.2^2$ oe   |
|   | <b>Alternative method 3</b>   |    |  |
|   | $12^2 - 9.6^2 (= 144 - 92.16) = 51.84$<br>and<br>$\sqrt{51.84} = 7.2$ or $7.2^2 = 51.84$              | B2 | B1 $12^2$ and $9.6^2$ oe   |
|   | <b>Alternative method 4</b>   |    |  |
|   | $\sqrt{7.2^2 + 9.6^2} = 12$<br>or<br>$\sqrt{12^2 - 7.2^2} = 9.6$<br>or<br>$\sqrt{12^2 - 9.6^2} = 7.2$ | B2 | condone $7.2^2 + 9.6^2 = 12^2$<br>or $12^2 - 7.2^2 = 9.6^2$<br>or $12^2 - 9.6^2 = 7.2^2$<br><br>B1 any two of<br>$7.2^2$ , $9.6^2$ and $12^2$ oe |
|   | <b>Additional Guidance</b>  |    |  |
|   | $7.2^2 + 9.6^2 = 144,$<br>$x^2 = 144, x = 12$   |    | B2   |
|   | Do not accept $144 \div 12 = 12$ for $\sqrt{144} = 12$  |    |  |
| Do not accept incorrect statements for B2<br>eg $7.2^2 + 9.6^2 = \sqrt{144} = 12$ |   |    |  |
| Do not accept scale drawing   |   |    |  |
| For eg $12^2$ accept $12 \times 12$   |   |    |  |

| Question  | Answer   | Mark  | Comments   |
|---|--|-------|--|
| <b>20</b>   | <b>Alternative method 1</b>  |       |  |
|   | $35x + 6x = ax$ or $35 + 6 = a$<br>or $41x = ax$                           | M1    |  |
|   | $a = 41$   | A1    |  |
|   | $40 + 3b = 13$   | M1    | oe   |
|   | $b = -9$   | A1    | SC3 $a = 41, b = -27$ or $a = 41, b = \frac{5}{3}$ |
|   | <b>Alternative method 2</b>  |       |  |
|   | $35x + 40 + 6x + 3b$<br>or $41x + 40 + 3b$                                 | M1    |  |
|   | $35x + 6x = ax$ or $35 + 6 = a$<br><b>and</b><br>$40 + 3b = 13$            | M1dep | oe<br>eg $41x = ax$ and $3b = -27$                 |
|   | $a = 41$   | A1    | implies first M1 only                              |
|   | $b = -9$   | A1    | SC3 $a = 41, b = -27$ or $a = 41, b = \frac{5}{3}$ |
|   | <b>Additional Guidance</b>   |       |  |
|   | $a = 41$ and $b = -9$  |       | M1A1M1A1   |
|   | $a = 41$ or $b = -9$   |       | M1A1   |
|   | $35x, 40, 6x$ and $3b$ seen without addition signs shown or implied        |       | M0   |
|   | $35x + 40 + 6x + b$ leading to an answer of $a = 41$ and $b = -27$         |       | SC3  |
|   | $35x + 8 + 6x + 3b$ leading to an answer of $a = 41$ and $b = \frac{5}{3}$ |       | SC3  |
|   | $35x + 8 + 6x + b$ leading to an answer of $a = 41$ and $b = 5$            |       | M1A1   |
|   | $a = 41x$  |       | M0   |
| For $\frac{5}{3}$ accept 1.66... or 1.67                |  |       |  |
| Condone multiplication signs eg $35 \times x$ for $35x$ |  |       |  |



| Question | Answer | Mark | Comments |
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| <b>21</b> | $4n + 3$                   | B1 |  |
|           | <b>Additional Guidance</b> |    |  |
|           |                            |    |  |

|              |  |       |   |
|--------------|--|-------|---|
| <b>22(a)</b> | $2.5 \times 12$ or 30<br>and<br>$7.5 \times 7$ or 52.5<br>and<br>$12.5 (\times 1)$<br>or<br>95   | M1    | allow one incorrect midpoint<br>or<br>$[2, 3] \times 12$ and $[7, 8] \times 7$<br>and $[12, 13] (\times 1)$<br><br>ignore $t \geq 15$ row |
|              | $\frac{\text{their } 30 + \text{their } 52.5 + \text{their } 12.5}{12 + 7 + 1}$ or $95 \div 20$  | M1dep | $t \geq 15$ product must be 0 if seen<br>condone bracket error seen<br>eg $30 + 52.5 + 12.5 \div 20$                                      |
|              | 4.75   | A1    | accept 4.8 or 5 if full working shown using <b>correct</b> midpoints  |
|              | <b>Additional Guidance</b>   |       |   |
|              | Two correct from 30, 52.5 and 12.5 implies the first mark and could be used to score up to M2  |       | M1  |
|              | Midpoints used in the ranges [2, 3], [7, 8] and [12, 13] must be seen<br>eg<br>$2.5 \times 12$ and $7 \times 7$ and $12 (\times 1)$<br>or $3 \times 12$ and $7 \times 7$ and $13 (\times 1)$<br>NB These could be used to score up to M2 |       | M1  |
|              | Correct products seen in the table but a different method shown in the working lines eg $20 \div 4 = 5$  |       | M0  |

|              |                            |    |  |
|--------------|----------------------------|----|--|
| <b>22(b)</b> | Lower than part (a)        | B1 |  |
|              | <b>Additional Guidance</b> |    |  |
|              |                            |    |  |

| Question | Answer  | Mark  | Comments   |  |
|----------|---|-------|--|--|
| 23       | $12 \times 6$ or 72   | M1    | oe<br>area of rectangle  |  |
|          | $\pi \times 6^2$ or $36\pi$<br>or [113, 113.112]  | M1    | oe<br>may be implied<br>eg $\pi \times 6^2 \div 4$ or $9\pi$ or [28.2, 28.3] |  |
|          | $\pi \times 6^2 \div 2$<br>or $18\pi$ or [56.4, 56.6]   | M1dep | oe<br>dep on 2nd M1  |  |
|          | [15.4, 15.5]<br>or $72 - 18\pi$   | A1    |  |  |
|          | <b>Additional Guidance</b>  |       |  |  |
|          | $72 - 18\pi = 54\pi$  |       | M1M1M1A0   |  |
|          | $\pi \times 6^2 \div 2$ scores 2nd and 3rd M1   |       |  |  |
|          | $12 \times 6 = 72$<br>$72 \div 2 = 36$ (unless identified as half of rectangle)   |       | (1st) M0   |  |
|          | $\pi \times 6^2$ scores 2nd M1 even if subsequently used incorrectly<br>eg $\pi \times 6^2 = 36\pi$<br>$36\pi \times 2 = 72\pi$ |       | (2nd) M1   |  |
|          | Ignore units throughout   |       |  |  |

| Question | Answer | Mark | Comments |
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|           |   |       |  |
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| <b>24</b> | <b>Alternative method 1</b> comparing with 7.5 minutes                              |       |  |
|           | 180 ÷ 135 or 180 ÷ 14<br>or<br>79.8 ÷ 14 or 79.8 ÷ 135                              | M1    | oe or reciprocals  |
|           | $\frac{14 \times 135}{180}$ or 10.5<br>or<br>$\frac{79.8 \times 180}{135}$ or 106.4 | M1dep | oe or reciprocals  |
|           | $\frac{79.8 \times 180}{14 \times 135}$ or 7.6                                      | M1dep | oe eg 79.8 ÷ 10.5 or 106.4 ÷ 14                              |
|           | No and 7.6 (and 7.5)  | A1    | oe eg No and 7 minutes 36 seconds (and 7 minutes 30 seconds) |
|           | <b>Alternative method 2</b> comparing with 79.8 litres                              |       |  |
|           | 135 ÷ 180 or 14 ÷ 180<br>or<br>7.5 × 14 or 7.5 ÷ 180                                | M1    | oe or reciprocals  |
|           | $\frac{14 \times 135}{180}$ or 10.5<br>or<br>$\frac{7.5 \times 135}{180}$ or 5.625  | M1dep | oe or reciprocals  |
|           | $\frac{7.5 \times 135 \times 14}{180}$ or 78.75                                     | M1dep | oe eg 10.5 × 7.5 or 5.625 × 14                               |
|           | No and 78.75  | A1    |  |

**Alternative methods and Additional Guidance continued on the next two pages**

| Question | Answer | Mark | Comments |
|----------|--------|------|----------|
|----------|--------|------|----------|

|                    |   |       |                            |
|--------------------|---|-------|----------------------------|
| <b>24<br/>cont</b> | <b>Alternative method 3</b> comparing with 14 litres per minute                       |       |                            |
|                    | 180 ÷ 135 or 180 ÷ 7.5<br>or<br>79.8 ÷ 135 or 79.8 ÷ 7.5                              | M1    | oe or reciprocals          |
|                    | $\frac{7.5 \times 135}{180}$ or 5.625<br>or<br>$\frac{79.8 \times 180}{135}$ or 106.4 | M1dep | oe or reciprocals          |
|                    | $\frac{79.8 \times 180}{7.5 \times 135}$ or [14.18, 14.19]                            | M1dep | oe                         |
|                    | No and [14.18, 14.19]   | A1    |                            |
|                    | <b>Alternative method 4</b> comparing new rate of flow with rate required             |       |                            |
|                    | 135 ÷ 180 or 14 ÷ 180   | M1    | oe or reciprocals          |
|                    | $\frac{14 \times 135}{180}$ or 10.5   | M1dep | oe                         |
|                    | 79.8 ÷ 7.5 or 10.64   | M1    | oe                         |
|                    | No and 10.5 and 10.64   | A1    |                            |
|                    | <b>Alternative method 5</b> comparing with 135 degrees                                |       |                            |
|                    | 180 ÷ 14 or 180 ÷ 7.5<br>or<br>79.8 ÷ 14 or 79.8 ÷ 7.5                                | M1    | oe or reciprocals          |
|                    | 180 ÷ 14 <b>and</b> 79.8 ÷ 7.5<br>or<br>180 ÷ 7.5 <b>and</b> 79.8 ÷ 14                | M1dep | oe or matching reciprocals |
|                    | $\frac{79.8 \times 180}{7.5 \times 14}$ or 136.8                                      | M1dep | dep on M2                  |
|                    | No and 136.8  | A1    |                            |

**Additional Guidance continued on the next page**

| Question | Answer | Mark | Comments |
|----------|--------|------|----------|
|----------|--------|------|----------|

|                    |   |    |  |
|--------------------|---|----|--|
| <b>24<br/>cont</b> | <b>Additional Guidance</b>  |    |  |
|                    | No may be implied eg It takes more                                    |    |  |
|                    | 7.3(0) used for 7.5 may score up to M3                                |    |  |
|                    | $7\frac{1}{2}$ minutes converted to 7.3(0) or 7 minutes 50 seconds    | A0 |  |
|                    | Ignore incorrect conversion of 7.6 to minutes and seconds if 7.6 seen |    |  |
|                    | Use the scheme that awards the most marks and ignore choice           |    |  |

| Question                                       | Answer   | Mark  | Comments   |
|--|--|-------|--|
| <b>25</b>                                      | $4x + 5 = 6x - 10$<br>or $4x + 5 = 10(x - 4)$<br>or $6x - 10 = 10(x - 4)$  | M1    | oe<br>eg $4x + 5 + 6x - 10 = 2 \times 10(x - 4)$<br>condone $10x - 4$ for $10(x - 4)$  |
|  | $4x - 6x = -10 - 5$<br>or $-2x = -15$<br>or $4x - 10x = -40 - 5$<br>or $-6x = -45$<br>or $6x - 10x = -40 + 10$<br>or $-4x = -30$   | M1dep | oe collection of terms<br>eg $4x + 6x - 20x = -80 - 5 + 10$<br>or $-10x = -75$<br>condone $10x - 4$ for $10(x - 4)$<br>eg $4x - 10x = -4 - 5$<br>or $6x - 10x = -4 + 10$ |
|  | (x =) 7.5  | A1    | oe<br>may be implied by (side length =) 35<br>or (perimeter =) 105   |
|  | $(6 \times \text{their } 7.5 - 10) \times 3$<br>or<br>$(4 \times \text{their } 7.5 + 5) \times 3$<br>or<br>$10 \times (\text{their } 7.5 - 4) \times 3$<br>or<br>$35 \times 3$<br>or<br>$6 \times \text{their } 7.5 - 10 + 4 \times \text{their } 7.5 + 5$<br>$+ 10 \times (\text{their } 7.5 - 4)$<br>or<br>$20 \times \text{their } 7.5 - 45$<br>or<br>105 | M1dep | oe<br>dep on M1M1<br>condone $10x - 4$ for $10(x - 4)$<br>must show working if M1M1A0  |
|  | 105 and Yes  | A1    | oe eg 1.05 and Yes   |
|  | <b>Additional Guidance</b>   |       |  |
|  | $4x + 5 = 6x - 10 = 10(x - 4)$   |       | M1   |
| Condone $10x - 4$ for $10(x - 4)$ for up to M3 |  |       |  |

| Question | Answer | Mark | Comments |
|----------|--------|------|----------|
|----------|--------|------|----------|

|           |  |    |                                  |
|-----------|--|----|----------------------------------|
| <b>26</b> | 3.041...   | M1 | condone 3.042                    |
|           | 3.14 – 3.041... = 0.09...<br>or<br>3.041... + 0.1 = 3.141...<br>or<br>3.041... and 3.14 – 0.1 = 3.04 | A1 | oe<br>condone 3.042 for 3.041... |
|           | <b>Additional Guidance</b>   |    |                                  |
|           | Must see calculation for the A mark  |    |                                  |
|           | Do not allow use of a more precise value of $\pi$ for the A mark                                     |    |                                  |

|           |   |    |  |
|-----------|---|----|--|
| <b>27</b> | $2.85 \times 10^6$  | B2 | B1 correct value not in standard form<br>eg 2 850 000 or $28.5 \times 10^5$<br>or<br>$2.9 \times 10^6$ |
|           | <b>Additional Guidance</b>  |    |  |
|           | Condone different spacing or commas eg 2850000 or 28,50,000         |    | B1   |
|           | $2.85.10^6$   |    | B1   |
|           | $2.85 \times 10^6$ in working with $2.9 \times 10^6$ on answer line |    | B2   |
|           | $2.85 \times 10^6$ in working with $3 \times 10^6$ on answer line   |    | B2   |
|           | $2.9 \times 10^6$ in working with $3 \times 10^6$ on answer line    |    | B1   |
|           | $3 \times 10^6$ only  |    | B0   |
|           | $2.85 \times 10^6$ in working with 2 850 000 on answer line         |    | B1   |
|           | 2 850 000 in working with 2 900 000 on answer line                  |    | B1   |
|           | 2 900 000 only  |    | B0   |
|           | 2 850 000 in working with $2.8 \times 10^6$ on answer line          |    | B1   |
|           | $2.8 \times 10^6$ only  |    | B0   |