



**General Certificate Secondary of Education
January 2013**

Methods in Mathematics (Pilot) 9365

Unit 1 Foundation Tier 93651F

Mark Scheme

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

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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.

| | |
|------------------------|--|
| M | Method marks are awarded for a correct method which could lead to a correct answer. |
| A | 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 | Marks awarded independent of method. |
| Q | Marks awarded for quality of written communication. (QWC) |
| M Dep | A method mark dependent on a previous method mark being awarded. |
| B Dep | A mark that can only be awarded if a previous independent mark has been awarded. |
| ft | Follow through marks. Marks awarded following a mistake in an earlier step. |
| SC | Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth. |
| oe | Or equivalent. Accept answers that are equivalent. eg, accept 0.5 as well as $\frac{1}{2}$ |
| [a, b] | Accept values between <i>a</i> and <i>b</i> inclusive. |
| 25.3 ... | Allow answers which begin 25.3 e.g. 25.3, 25.31, 25.378. |
| Use of brackets | It is not necessary to see the bracketed work to award the marks. |

M1 Foundation Tier

| Q | Answer | Mark | Comments |
|------|-----------------------------|------|---|
| 1 | 25 (%) | B1 | |
| | 0.4(0) | B1 | |
| | $\frac{9}{10}$ | B1 | oe fraction eg, $\frac{90}{100}$ |
| 2 | $20 \div 3.75 (= 5.3\dots)$ | M1 | Or $3.75 \times 5 = 18.75$ Or $3.75 \times 6 = 22.5(0)$ Or Build up of 3.75s up to 18.75 allowing 1 error cumulatively Or Subtraction of 3.75s from 20 to 1.25 allowing 1 error cumulatively |
| | 5 | A1 | |
| 3(a) | Evens | B1 | |
| 3(b) | There are more green pens | B1 | |
| 3(c) | E | B1 | |
| 4 | 8, 8, 18 | B3 | B2 any three criteria met from: 3 positive whole numbers 3 numbers add to 34 exactly 1 multiple of 9 2 numbers the same B1 any two criteria met |
| 5 | Even | B1 | |
| 6(a) | 0.6×35 | M1 | oe or build up method |
| | 21 | A1 | SC1 14 |
| 6(b) | $150 \div 5 \times 4$ | M1 | Oe Or 30 seen |
| | 120 | A1 | |

| Q | Answer | Mark | Comments |
|----------|---|-------|---|
| 7 | $76 - 4 (= 72)$ | M1 | Multiples of 9 listed up to 72 |
| | Their $72 \div 9$ | M1dep | Adds on 4 |
| | 8 | A1 | |
| 7 Alt | $76 \div 9$ | M1 | |
| | 8.4(...) or 8 r 4 | A1 | |
| | 8 | A1 | |
| 8(a) | $(17 + 3) \div 4$ | M1 | $20 \div 4$ |
| | 5 | A1 | SC1 17.75 |
| 8(b) | 18, 19, 20 | B3 | B2 All 3 correct answers with extra incorrect answers or any 2 correct answers with or without extra incorrect answers B1 1 correct answer with or without extra incorrect answers or any correct reverse trial starting with a number between 5 and 6 |
| 9(a) | 7 | B1 | |
| 9(b) | Points correctly plotted | M1 | ft from their table |
| | Correct line drawn for $-1 \leq x \leq 3$ | A1 | |
| 9(c) | $y = 5$ drawn | B1 | |
| 10(a) | $11a + 3b$ or $3b + 11a$ | B2 | or $3b + 11a$ B1 for one term correct |
| 10(b) | $6x + 18$ | B1 | |

| Q | Answer | Mark | Comments |
|----------------------|---|------|--------------------------|
| 11(a) | $1 - 0.2 - 0.15 - 0.3$ | M1 | $1 - 0.65$ |
| | 0.35 | A1 | oe |
| 11(b) | 0.5 | B1 | oe |
| 11(c) | 200×0.15 or $\frac{30}{200}$ | M1 | oe |
| | 30 | A1 | SC1 170 |
| 11(c) Alt | $200 - (200 \times 0.2 + 200 \times 0.3 + 200 \times \text{their } 0.35)$ | M1 | |
| | 30 | A1 | SC1 170 |
| 12 | $\frac{3}{4} - \frac{1}{8} \left(= \frac{5}{8} \right)$ oe or $\frac{6}{8}$ seen | M1 | |
| | 45 (litres) = their $\frac{5}{8}$ | M1 | |
| | $45 \div \text{their } 5 (= 9)$ | M1 | Their 5 cannot be 1 or 2 |
| | 72 | A1 | SC2 60 |
| 12 Alt 1 | Diagram with $\frac{1}{8}$ and $\frac{6}{8}$ indicated | M1 | oe |
| | 45 identified between $\frac{1}{8}$ and $\frac{6}{8}$ | M1 | |
| | Each section = 9 | A1 | |
| | 72 | A1 | SC2 60 |
| 12 Alt 2 | $\frac{x}{8} + 45 = \frac{3x}{4}$ | M1 | oe |
| | $x + 360 = 6x$ | M1 | oe |
| | $360 = 5x$ | M1 | |
| | 72 | A1 | SC2 60 |

| Q | Answer | Mark | Comments |
|-------|---|------|---|
| 13(a) | Evidence of adding | M1 | eg, carrying 1 into 10s column adding on from 629 in stages $700 + 70 + 13$ |
| | 783 | A1 | |
| 13(b) | 85 | B1 | |
| 13(c) | 32 | B1 | |
| 14(a) | (1, 4) | B1 | |
| 14(b) | M plotted at (3, 4) | M1 | |
| | B plotted at (5,4) | A1 | SC 1 (7, 2) |
| 15(a) | Evidence of subtraction | M1 | eg, 'carrying' of 1 Subtraction of 1000, then 200, then 30 $813 - 30$ Or adding on from 1230 to 2013 |
| | 783 | A1 | |
| 15(b) | Sight of 2031 | B1 | |
| | Their 2031 – 2013 | M1 | or adding on from 2013 to their 2031 |
| | 18 | A1ft | ft 4 digit number using 0, 1, 2, and 3 when 2031 has not been seen |
| 16(a) | Cannot say and reason eg, don't know how many boys and girls there are | B1 | |
| 16(b) | $\frac{7}{30}$ | B1 | |
| 17(a) | $\frac{6}{24}$ | B2 | oe B1 for correct numerator or denominator |
| 17(b) | $2 \times 18 (= 36)$ | M1 | or 6 (cows) + pigs = 18 (sheep) or $18 - 6$ |
| | 12 | A1ft | ft their (18 + 6) from (a) |

| Q | Answer | Mark | Comments | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------|--|-------|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---|---|---|----|----|----|-------------------------|
| 18(a) | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black;"></td> <td>1</td> <td>3</td> <td>5</td> <td>7</td> </tr> <tr> <td style="border-right: 1px solid black;">0</td> <td>1</td> <td>3</td> <td>5</td> <td>7</td> </tr> <tr> <td style="border-right: 1px solid black;">2</td> <td>3</td> <td>5</td> <td>7</td> <td>9</td> </tr> <tr> <td style="border-right: 1px solid black;">4</td> <td>5</td> <td>7</td> <td>9</td> <td>11</td> </tr> <tr> <td style="border-right: 1px solid black;">6</td> <td>7</td> <td>9</td> <td>11</td> <td>13</td> </tr> </table> | | 1 | 3 | 5 | 7 | 0 | 1 | 3 | 5 | 7 | 2 | 3 | 5 | 7 | 9 | 4 | 5 | 7 | 9 | 11 | 6 | 7 | 9 | 11 | 13 | B2 | B1 for 1, 2 or 3 errors |
| | 1 | 3 | 5 | 7 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 3 | 5 | 7 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 3 | 5 | 7 | 9 | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 5 | 7 | 9 | 11 | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 7 | 9 | 11 | 13 | | | | | | | | | | | | | | | | | | | | | | | | |
| 18(b) | 0 | B1 ft | ft from a completed table | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18(c) | $\frac{12}{16}$ | B2ft | oe ft from a completed table B1ft for their numerator or denominator correct or $\frac{2}{8}$ or $\frac{1}{4}$ | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | |
|--------------|--|----|-------------------------|
| 19(a) | 1681 | B1 | |
| 19(b) | 42 | B1 | |
| 19(c) | 18.04 | B2 | B1 sight of digits 1804 |
| 19(d) | $42 \times 44 \times 2 (= 1848 \times 2)$ or $(41 + 43) \times 44 (= 1804 + 1892)$ | M1 | |
| | 3696 | A1 | |

| | | | |
|-----------|---------------|----|--|
| 20 | $3x > 13 + 5$ | M1 | oe $3x > 18$ $3x - 18 > 0$ $x - 6 > 0$ $x > \frac{18}{3}$ |
| | $x > 6$ | A1 | SC1 $x \geq 6$ |

| Q | Answer | Mark | Comments |
|-------------------|--|------|--|
| 21 | 0.84 | B1 | oe $\frac{84}{100}$ |
| | $17 \div 20$ attempted | M1 | $\frac{17 \times 5}{20 \times 5}$ |
| | 0.85 | A1 | $\frac{85}{100}$ |
| | $\frac{17}{20}$ selected and 0.84 and 0.85 | Q1 | oe QWC - Strand (iii) - Writing both as decimals or percentages or both as fractions with same denominator and correct decision for their working |
| 21 Alt | 0.84 | B1 | oe $\frac{84}{100}$ |
| | $\frac{\text{Their } 85 \div 5}{20}$ | M1 | |
| | $\frac{16.8}{20}$ | A1ft | ft B0 M1 |
| | $\frac{17}{20}$ selected and $\frac{16.8}{20}$ | Q1 | QWC - Strand (iii) – Writing both as a fraction with 20 as denominator and correct decision for their working |
| 22(a) | $x + 10$ | Q1 | QWC - Strand (i) – correct notation |
| 22(b) | $3x + 2 \times \text{their } (x + 10) = 95$ | B1ft | oe $3x + 2x + 20 = 95$ $5x + 20 = 95$ ft their $x + 10$ |
| 22(c) | Their $(5x + 20) = 95$ | M1 | Simplification of their equation (from at least two terms in x) May be in part (b) |
| | $(95 - \text{their } 20) \div \text{their } 5$ | M1 | Their 5 cannot be 1 |
| | 15 | A1 | |