DIRECTORATE FOR QUALITY AND STANDARDS IN EDUCATION
Department of Curriculum Management
Educational Assessment Unit

**LEVELS**
**6 – 7**

**Annual Examinations for Secondary Schools 2014**

# FORM 2 MATHEMATICS MARKING SCHEME

**Notes for Marking of Scripts**

*Types of Marks*

- **M**(ethod) marks are awarded for knowing a correct method of solution and attempting to apply it. Method marks cannot be lost for arithmetic mistakes. They can only be awarded if the method used would have led to the correct answer had not an arithmetic mistake been made. In general a correct method is implied by a correct answer and therefore **when a correct answer is given and no work is shown, no method marks are lost**.
- **A**(ccuracy) marks are given for correct answer only (c.a.o.) Incorrect answers, even though nearly correct, score no marks. Accuracy marks are also awarded for incorrect answers which are correctly followed through (f.t.) from an incorrect previous answer, **provided that f.t. is indicated in the marking scheme**. No method (M) or accuracy (A) marks are awarded when a wrong method leads to a correct answer.
- **B** marks are accuracy marks awarded for specific results or statements independent of the method used.

*Misreading*
M marks can still be earned (unless that part of the question is trivialized) but the final A marks are lost.

*Crossed out working*
An answer or working that is crossed out and not replaced is marked as if it was not crossed out. If the answer or working is replaced, then the crossed out answer or working is ignored and should not be considered for marking.

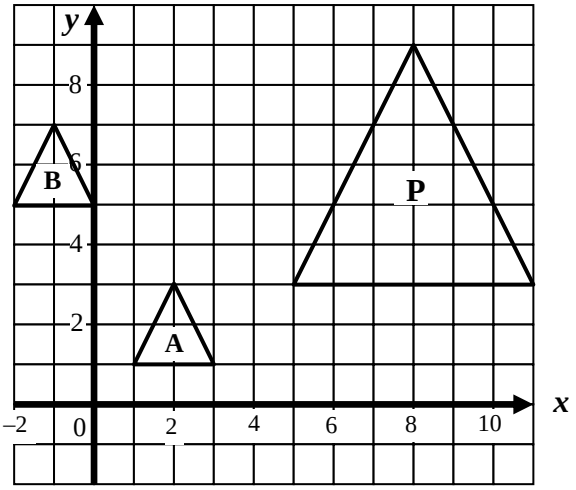
*Units*
In general, missing or inaccurate units are not penalised unless otherwise indicated in the marking scheme.

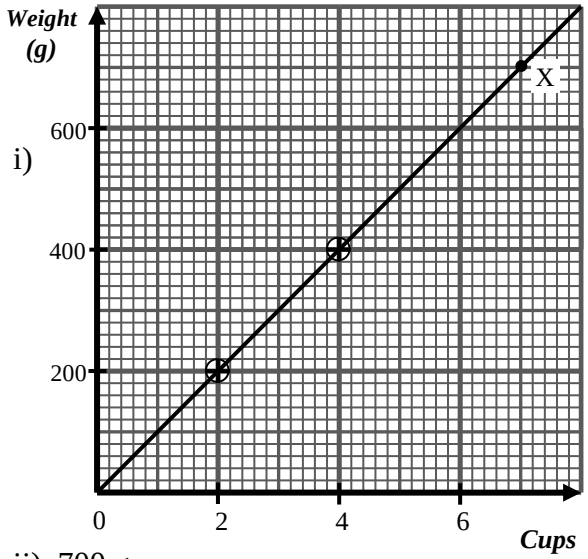
*Other*
- Incorrect working or statement following a correct answer is ignored.
- Marks are not sub-divisible; no half marks may be awarded.
- Other abbreviations used:
  - o.e. (or equivalent)
  - e.e.o.o. (each error or omission)
- Markers are advised to indicate the M, A or B marks awarded in the body of the script and then write their total in the margin. The total mark for each question should be written in the table included at the top of page 1 of the main paper. This measure facilitates the moderation of papers.

**Non Calculator Paper (25 marks)**

| Que. | | Requirements | Mark | | Additional Guidance | Lev. |
|---|---|---|---|---|---|---|
| **1** | a | $25s$ | B1 | | | 6 |
| | b | $2 \times 4 \times 8$<br>$= 64$ | M1<br>A1 | **3** | | 6 |
| **2** | a | 16 | B1 | **2** | | 6 |
| | b | Subtract 6 every time | B1 | | o.e. | 7 |
| **3** | | $7 \times 5 = 35$<br>3 + 35 = 38 | M1<br>A1 | **2** | | 6 |
| **4** | | Two multiples from 36, 39 and 42 | B2 | **2** | 1 mark each | 6 |
| **5** | a | $\frac{3}{10} = 30\%$ | B1 | **3** | | 7 |
| | b | $30\% > 0.06$ | B1 | | | |
| | c | $0.06 < 1.01$ | B1 | | | |
| **6** | | $\frac{60}{200} \times 100\%$<br>= 30% | M1<br>A1 | **2** | | 6 |
| **7** | a | 22 $cm^2$ | B1 | **2** | | 6 |
| | b | $8 \div 2 = 4$ $cm^2$ | B1 | | | 7 |
| **8** | | –7 | B1 | **1** | | 7 |
| **9** | a | $24 = 2 \times 2 \times 2 \times 3$ (o.e.) | B2 | **4** | 1 mark for every 2 correct entries | 7 |
| | b | $18 = 2 \times 3 \times 3$<br>HCF is $2 \times 3 = 6$ | M1<br>A1 | | | 7 |
| **10** | a | 2 : 3 | B1 | **4** | | 7 |
| | b | 12:18<br>2 + 3 = 5. $10 \div 5 = 2$<br>Sidor's share is $2 \times 2$ = 4 tons | M1<br>M1<br>A1 | | Seen or implied<br>Accept any other valid method | 7 |

**Main Paper (75 marks)**

| Que. | | Requirements | Mark | | Additional Guidance | Lev. |
|---|---|---|---|---|---|---|
| **1** | a |  | B1<br>B1 | **4** | Moves 3 left<br>Moves 4 up | 7 |
| | b | 3<br>(–1, 0) | B1<br>B1 | | | 7 |
| **2** | a | i) ABC or DEF<br>ii) AD or CF | B1<br>B1<br>B1 | **6** | One correct choice<br>One correct choice<br>ABC, DEF, AD and CF chosen in parts i) and ii) | 6 |
| | b | Volume = Area of cross section × length<br>Volume = 6.4 $cm^2$ × 17.26 cm<br>Volume = 110.464 $cm^3 \approx$ 110.5 $cm^3$ | M1<br>M1<br>A1 | | Seen or implied | 7 |
| **3** | | $4\boldsymbol{n} + 8 = 22$<br>$4\boldsymbol{n} = 22 - 8$<br>$4\boldsymbol{n} = 14$<br>$\boldsymbol{n} = 14 \div 4$<br>$\boldsymbol{n} = 3.5$ | M1<br><br>M1<br><br>A1 | **3** | Accept alternative methods | 7 |
| **4** | a | i) $\frac{1}{9}$<br>ii) $\frac{2}{9}$ | B1<br>B1 | **4** | | 7 |
| | b | $\frac{4}{9}$ | B1<br>B1 | | Numerator<br>Denominator | 7 |
| **5** | a | Any value in range 66 $\leq$ speed $\leq$ 68 km/h | B1 | **3** | | 6 |
| | b | No<br>Example: the scale on Jessica's speedometer may be different than that on Mark's.<br>Example: Units of speed may be different | B1<br>B1 | | Accept any other valid reason | 7 |

| Que. | | Requirements | Mark | | Additional Guidance | Lev. |
|---|---|---|---|---|---|---|
| **6** | a |  | B2 | **6** | B1 for each point | 6 |
| | b | Straight line | B1 | | | |
| | c | i) Point 'X' | B1 | | | |
| | | ii) 700 g | B1 | | | |
| | d | $\boldsymbol{y} = \underline{100}\ \boldsymbol{x}$ | B1 | | | 6 |
| **7** | a | i) 14<br>ii) 8 | B1<br>B1 | **7** | | 6 |
| | b | 8 | B1 | | | 6 |
| | c | $\frac{14}{28} + \frac{8}{28} = \frac{22}{28}$ or $\frac{11}{14}$ | M1<br>A1f.t. | | f.t. from part a) | 7 |
| | d | $\frac{28}{28} - \frac{22}{28} = \frac{6}{28}$<br>6 days | M1<br>A1f.t. | | Accept any other valid method<br>f.t. from part c) | 7 |
| **8** | a | €12 + €4 = €16 | B1 | **6** | | 7 |
| | b | €12 × 5 + €4 = €64 | B1 | | | 7 |
| | c | $\boldsymbol{C} = 12\boldsymbol{n} + 4$ | M1<br>A1 | | For '$12\boldsymbol{n}$' | 7 |
| | d | Yes<br>Reason: <u>Example:</u> You only pay once for the postage, no matter the number of films<br><u>Example:</u> 1 film costs €16 but 5 films cost €64 i.e. €64 ÷ 5 = €12.80 each film | B1<br>B1 | | Accept any other valid reason | 7 |
| **9** | a | $\frac{20}{100} \times 5 = €1$<br>€5 + €1 = €6 | M1<br>A1 | **4** | Accept any other valid method | 6 |
| | b | $\frac{45}{100} \times 8 = 3.6$ kg<br>8 – 3.6 = 4.4 kg | M1<br>A1 | | Accept any other valid method | 7 |
| **10** | a | The angle between the bisector and AB is between 31° and 35° | B1 | **6** | | 7 |
| | b | Arcs correctly drawn<br>Line accurately drawn | M2<br>A1 | | | 7 |
| | c | Point X<br>AX between 7.8 cm and 8.3 cm | B1<br>B1 | | Seen or implied<br>Both values included | 7 |

| Que. | | Requirements | Mark | Additional Guidance | | Lev. |
|---|---|---|---|---|---|---|
| **11** | b | 5 | B1 | **5** | | 6 |
| | c | D | B1 | | | 7 |
| | d | 2<br>−6 | B1<br>B1 | | | 7 |
| | e | B | A1f.t. | | From part d) | 7 |
| **12** | a | 7 friends | B1 | **5** | | 7 |
| | b | $1 + 4 + 7 + 8 + 3 + 2$<br>$= 25$ friends | M1<br>A1 | | | 7 |
| | c | $4 + 7 + 8$<br>$= 19$ friends | M1<br>A1 | | | 7 |
| **13** | | a = 80°<br>Alternate angles are equal | B1<br>B1 | **8** | o.e. | 7 |
| | | b = 80°<br>Vertically opposite angles are equal | B1f.t.<br>B1 | | o.e. | 6 |
| | | c = 70°<br>Corresponding angles are equal | B1<br>B1 | | o.e. | 7 |
| | | $80° + 70° = 150°$<br>d = 180° – 150° = 30°<br>Angles in a triangle add up to 180° | A1f.t.<br>B1 | | o.e. | 7 |
| **14** | a | obtuse | B1 | **8** | | 6 |
| | b | i) AB = 25 cm ÷ 5<br>= 5 cm<br>ii) BC = 40 cm ÷ 5<br>= 8 cm | M1<br>A1<br><br>A1 | | D ivides either AB or BC by 5 | 7 |
| | c) | AB = 5 cm $\pm$ 0.2 cm<br>BC = 8 cm $\pm$ 0.2 cm<br>$\angle$ B = 120° $\pm$ 2° | B1 f.t.<br>B1 f.t.<br>B1 | | f.t. from part b i)<br>f.t. from part b ii) | 7 |
| | d) | AC = 11.4 × 5 = 57 cm | B1 | | Accept values between 56 cm and 58 cm, both values inclusive. | 7 |