



**Annual Examinations for Middle Schools 2023**

**YEAR 8**

**MATHEMATICS**

**MARKING SCHEME**

**Notes for Marking of Scripts**

***Types of Marks***

Method 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. Unless otherwise stated, any valid method not specified in the marking scheme is to be accepted and marked accordingly.

There are two types of Method marks: **M** marks and **(M)** marks.

- **M marks** are only awarded if method is seen.
- **(M) marks** are awarded even when a correct answer is given and no work is shown.

There are two types of Accuracy marks: **A** marks and **B** marks.

- **A** marks are accuracy marks 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 marks **M/(M)** or Accuracy marks **A** are awarded when a wrong method leads to a correct answer.
  - \* When a question is assigned **M** and **A** marks and students present a correct answer without any working, only **A** marks are awarded.
- **B** marks are accuracy marks awarded for specific results or statements independent of the method used.

***Misreading***

Method marks can still be earned (unless that part of the question is trivialised) but the final Accuracy marks are lost.

***Crossed out working***

An answer or working that is crossed out and not replaced is marked as if it were 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***

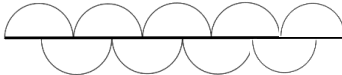
- Incorrect working or statement following a correct answer is ignored.
- Marks are not sub-divisible; no half marks may be awarded.
- Other abbreviations used:
  - o.e. (or equivalent)
  - e.e.o.o. (each error or omission)
- Markers are advised to indicate the M, (M), A or B marks awarded in the body 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                 |
|------|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---|-------------------------------------|
| 1    | a) | i) 2, 4, 6, 8, 10, 12<br>ii) 4, 8, 12, 16, 20, 24<br>iii) 6, 12, 18, 24, 30, 36                                                                                                           | B1<br>B1<br>B1        | 6 |                                     |
|      | b) | 12                                                                                                                                                                                        | B1                    |   |                                     |
|      | c) | 45<br>It is the only number that is not prime                                                                                                                                             | B1<br>B1              |   |                                     |
| 2    | a) | $\frac{4}{3} + \frac{4}{5}$ OR $\frac{5}{15} + \frac{12}{15}$<br>$\frac{20}{15} + \frac{12}{15}$ OR $\frac{17}{15} = 1\frac{2}{15}$<br>$\frac{32}{15} = 2\frac{2}{15}$ OR $2\frac{2}{15}$ | M1<br><br>M1<br>M1 A1 | 6 | Both fractions in each case correct |
|      | b) | Valid attempt to simplify and/or multiply<br>$\frac{1}{15}$                                                                                                                               | (M)1<br>A1            |   |                                     |
| 3    | a) | 10 sweets                                                                                                                                                                                 | B1                    | 4 |                                     |
|      | b) | $20\% = \frac{1}{5}$<br>$\frac{1}{5} \times \frac{60}{1} = 12$ sweets<br>$60 - 10 - 12 = 38$                                                                                              | M1<br>(M)1<br>A1      |   |                                     |
| 4    | a) | i) 216<br>ii) 9<br>iii) 24                                                                                                                                                                | B1<br>B1<br>B1 ft     | 5 | ft from ai) and aii)                |
|      | b) | $a = 6 - 10$<br>$a = -4$                                                                                                                                                                  | M1<br>A1              |   |                                     |
| 5    | a) | Netball                                                                                                                                                                                   | B1                    | 4 |                                     |
|      | b) | i) $\frac{13}{50}$<br>ii) 0.26                                                                                                                                                            | B1<br>B1              |   |                                     |
|      | c) | 7 : 2                                                                                                                                                                                     | B1                    |   |                                     |

## Main Paper (75 marks)

| Que. |    | Requirements                                                      | Mark                |   | Additional Guidance           |
|------|----|-------------------------------------------------------------------|---------------------|---|-------------------------------|
| 1    | a) | 15:00 + 2:30<br>17:30                                             | (M)1<br>A1          | 7 |                               |
|      | b) | 1 h 30 min + 1 h<br>2 hours 30 minutes                            | (M)1<br>A1          |   | Both correct; seen or implied |
|      | c) | 2 h 30 min $\times$ 21<br>52.5 hours<br>2 days 4 hours 30 minutes | (M)1<br>M1<br>A1 ft |   | ft from b)                    |

|                |                                                              |                                                                                                                                                                                                                                                              |                                         |              |                                                 |               |   |          |                |        |        |    |   |                                        |
|----------------|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------------|-------------------------------------------------|---------------|---|----------|----------------|--------|--------|----|---|----------------------------------------|
| 2              | a)                                                           |                                                                                                                                                                             | B1                                      | 4            |                                                 |               |   |          |                |        |        |    |   |                                        |
|                | b)                                                           | 5, 7, 9, ..., 17                                                                                                                                                                                                                                             | M3                                      |              | -1 e.e.o.o.                                     |               |   |          |                |        |        |    |   |                                        |
| 3              | a)                                                           | $\times 2$ ; $-3$                                                                                                                                                                                                                                            | B1 B1                                   | 6            |                                                 |               |   |          |                |        |        |    |   |                                        |
|                | b)                                                           | $s = 3 \times 2 - 3 = 3$<br>$t = 11 + 3 = 14$<br>$14 \div 2 = 7$                                                                                                                                                                                             | M1 A1 ft<br>M1<br>A1 ft                 |              | ft from a)<br><br>ft from a)                    |               |   |          |                |        |        |    |   |                                        |
| 4              | a)                                                           | i) 1<br>ii) Opposite angles in kite<br>$x = 101^\circ$<br>Sum of angles in a quad = $360^\circ$<br>$y = 360^\circ - (101^\circ + 101^\circ + 32^\circ)$<br>$= 126^\circ$                                                                                     | B1<br>M1<br>A1<br>M1<br>M1<br>A1 ft     | 7            | <br><br><br><br><br>ft from answer of angle $x$ |               |   |          |                |        |        |    |   |                                        |
|                | b)                                                           | Order 4                                                                                                                                                                                                                                                      | B1                                      |              |                                                 |               |   |          |                |        |        |    |   |                                        |
| 5              | a)                                                           | <table border="1"><tr><td></td><td>Even numbers</td><td>Odd numbers</td></tr><tr><td>Prime numbers</td><td>2</td><td>3, 7, 11</td></tr><tr><td>Multiples of 5</td><td>10, 80</td><td>15, 35</td></tr></table>                                                |                                         | Even numbers | Odd numbers                                     | Prime numbers | 2 | 3, 7, 11 | Multiples of 5 | 10, 80 | 15, 35 | B4 | 5 | Award B1 for every two correct entries |
|                |                                                              | Even numbers                                                                                                                                                                                                                                                 | Odd numbers                             |              |                                                 |               |   |          |                |        |        |    |   |                                        |
| Prime numbers  | 2                                                            | 3, 7, 11                                                                                                                                                                                                                                                     |                                         |              |                                                 |               |   |          |                |        |        |    |   |                                        |
| Multiples of 5 | 10, 80                                                       | 15, 35                                                                                                                                                                                                                                                       |                                         |              |                                                 |               |   |          |                |        |        |    |   |                                        |
| b)             | Any valid answer from 1 to 20: 1, 4, 6, 8, 9, 12, 14, 16, 18 | B1                                                                                                                                                                                                                                                           |                                         |              |                                                 |               |   |          |                |        |        |    |   |                                        |
| 6              | a)                                                           | i) $400 \div 20 = 20$<br>$20 \times 150 = 3000$ g<br>ii) $250 \div 20 = 12.5$<br>$12.5 \times 150 = 1875$ ml                                                                                                                                                 | M1<br>A1<br>M1<br>A1                    | 10           | o.e.<br><br>o.e.                                |               |   |          |                |        |        |    |   |                                        |
|                | b)                                                           | i) $\frac{5}{10} \times \frac{150}{1}$<br>75 chocolate filled muffins<br>ii) $\frac{3}{10} \times \frac{150}{1}$<br>45 caramel filled muffins<br>iii) $\frac{2}{10} \times \frac{150}{1}$<br>30 strawberry jam filled muffins<br>$45 - 30 = 15$ more muffins | M1<br>A1<br>M1<br>A1<br><br>M1<br>A1 ft |              | <br><br><br><br><br>ft from bii)                |               |   |          |                |        |        |    |   |                                        |
| 7              | a)                                                           | $d - f = 4c$<br>$c = \frac{d - f}{4}$                                                                                                                                                                                                                        | M1<br>A1                                | 9            |                                                 |               |   |          |                |        |        |    |   |                                        |
|                | b)                                                           | $4m - 9 = 15$<br>$4m = 24$<br>$m = 6$                                                                                                                                                                                                                        | M1<br>M1<br>A1                          |              |                                                 |               |   |          |                |        |        |    |   |                                        |
|                | c)                                                           | i) $7(x + 3) = 112$<br>$7x = 91$<br>$x = 13$<br>ii) 16 cm                                                                                                                                                                                                    | M1<br>M1<br>A1<br>A1 ft                 |              | ft from ci)                                     |               |   |          |                |        |        |    |   |                                        |

|         |                           |                                                                                                                                                                                                                                                                                                                                                                                                  |                    |       |                                                                                                                                                                                                                                                        |       |       |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
|---------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|--|--|--|--|--|---|---|---|---|---|---|---------|---|--|--|-------|-------|-------|-------|---|-------|-------|-------|-------|-------|-------|----|---|--------------------------------------|
| 8       |                           | $11.7 \times 5.8 = 67.86 \text{ mm}^2$<br>$5.8 \times 19.2 = 111.36 \text{ mm}^2$<br>$11.7 \times 19.2 = 224.64 \text{ mm}^2$<br>$403.86 \times 2$<br>$807.72 \text{ mm}^2$                                                                                                                                                                                                                      | M2<br><br>M1<br>A1 | 4     | M2 for finding area of three faces<br>M1 for finding area of two faces<br><br>Award M1 for doubling total<br>If doubling is done per face, ignore all of the above and award:<br>M1 for each correct entry ( $M1 \times 3$ );<br>A1 for correct answer |       |       |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
| 9       | a)                        | i) $9.8 \times 4.4 = 43.12 \text{ m}^2$<br>$3.4 \times 4.2 = 14.28 \text{ m}^2$<br>$43.12 + 14.28 = 57.4 \text{ m}^2$                                                                                                                                                                                                                                                                            | M1<br>M1<br>A1     | 10    |                                                                                                                                                                                                                                                        |       |       |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
|         |                           | ii) $\frac{5.6 \times 3.4}{2}$<br>$9.52 \text{ m}^2$                                                                                                                                                                                                                                                                                                                                             | M1<br>A1           |       |                                                                                                                                                                                                                                                        |       |       |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
|         |                           | iii) Whole plot = $11.2 \times 7.8 = 87.36 \text{ m}^2$<br>$87.36 - 57.4 - 9.52$<br>$20.44 \text{ m}^2$                                                                                                                                                                                                                                                                                          | M1<br>M1<br>A1 ft  |       | ft from ai) and aii)                                                                                                                                                                                                                                   |       |       |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
|         | b)                        | $\frac{9.52}{87.36} \times 100 = 10.897\%$<br>$10.9\%$                                                                                                                                                                                                                                                                                                                                           | M1<br>A1 ft        |       | ft from aii) and aiii)                                                                                                                                                                                                                                 |       |       |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
| 10      | a)                        | Correct construction of line using compasses                                                                                                                                                                                                                                                                                                                                                     | M1                 | 5     | ( $\pm 0.2 \text{ cm}$ )                                                                                                                                                                                                                               |       |       |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
|         | b)                        | Correct drawing of angle B<br>Correct drawing of angle C<br>Labelling of triangle ABC                                                                                                                                                                                                                                                                                                            | M1<br>M1<br>B1     |       | ( $\pm 2^\circ$ )<br>( $\pm 2^\circ$ )                                                                                                                                                                                                                 |       |       |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
|         | c)                        | AC = 5.3 cm                                                                                                                                                                                                                                                                                                                                                                                      | A1                 |       | ( $\pm 0.2 \text{ cm}$ )                                                                                                                                                                                                                               |       |       |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
| 11      | a)                        | <table><tr><td colspan="2"></td><td colspan="6">Dice</td></tr><tr><td colspan="2"></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td rowspan="2">Counter</td><td>3</td><td></td><td></td><td>(3,3)</td><td>(4,3)</td><td>(5,3)</td><td>(6,3)</td></tr><tr><td>8</td><td>(1,8)</td><td>(2,8)</td><td>(3,8)</td><td>(4,8)</td><td>(5,8)</td><td>(6,8)</td></tr></table> |                    |       | Dice                                                                                                                                                                                                                                                   |       |       |  |  |  |  |  | 1 | 2 | 3 | 4 | 5 | 6 | Counter | 3 |  |  | (3,3) | (4,3) | (5,3) | (6,3) | 8 | (1,8) | (2,8) | (3,8) | (4,8) | (5,8) | (6,8) | B2 | 4 | Award B1 for every 5 correct entries |
|         |                           |                                                                                                                                                                                                                                                                                                                                                                                                  | Dice               |       |                                                                                                                                                                                                                                                        |       |       |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
|         |                           | 1                                                                                                                                                                                                                                                                                                                                                                                                | 2                  | 3     | 4                                                                                                                                                                                                                                                      | 5     | 6     |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
| Counter | 3                         |                                                                                                                                                                                                                                                                                                                                                                                                  |                    | (3,3) | (4,3)                                                                                                                                                                                                                                                  | (5,3) | (6,3) |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
|         | 8                         | (1,8)                                                                                                                                                                                                                                                                                                                                                                                            | (2,8)              | (3,8) | (4,8)                                                                                                                                                                                                                                                  | (5,8) | (6,8) |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
| b)      | i) $\frac{1}{4}$<br>ii) 0 | B1<br>B1                                                                                                                                                                                                                                                                                                                                                                                         | o.e.               |       |                                                                                                                                                                                                                                                        |       |       |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
| 12      | a)                        |                                                                                                                                                                                                                                                                                                                                                                                                  | M1                 | 4     | For correct reflection                                                                                                                                                                                                                                 |       |       |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
|         | b)                        |                                                                                                                                                                                                                                                                                                                                                                                                  | M1<br>A1           |       | Award M1 for correct orientation<br>Award A1 for exact position                                                                                                                                                                                        |       |       |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |
|         | c)                        |                                                                                                                                                                                                                                                                                                                                                                                                  | M1                 |       | For correct translation                                                                                                                                                                                                                                |       |       |  |  |  |  |  |   |   |   |   |   |   |         |   |  |  |       |       |       |       |   |       |       |       |       |       |       |    |   |                                      |