

Mark scheme for 1MA1 Higher themed papers: Factors, Multiples and Primes

GCSE Mathematics (1MA1)

Themed papers – Factors, Multiples and Primes

Compiled from student-friendly mark schemes

Please note that this mark scheme is not the one used by examiners for making scripts. It is intended more as a guide to good practice, indicating where marks are given for correct answers. As such, it doesn't show follow-through marks (marks that are awarded despite errors being made) or special cases.

It should also be noted that for many questions, there may be alternative methods of finding correct solutions that are not shown here – they will be covered in the formal mark scheme.

NOTES ON MARKING PRINCIPLES

Guidance on the use of codes within this mark scheme

M1 – method mark. This mark is generally given for an appropriate method in the context of the question. This mark is given for showing your working and may be awarded even if working is incorrect.

P1 – process mark. This mark is generally given for setting up an appropriate process to find a solution in the context of the question.

A1 – accuracy mark. This mark is generally given for a correct answer following correct working.

B1 – working mark. This mark is usually given when working and the answer cannot easily be separated.

C1 – communication mark. This mark is given for explaining your answer or giving a conclusion in context supported by your working.

Some questions require all working to be shown; in such questions, no marks will be given for an answer with no working (even if it is a correct answer).

Question 1 (Total 2 marks)

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---|------|--|
| | 56 2×28 $2 \times 2 \times 14$ | M1 | This mark is given for a complete method to find prime factors |
| | $2 \times 2 \times 2 \times 7$ or $2^3 \times 7$ | A1 | This mark is given for the correct answer only |

Question 2 (Total 2 marks)

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---|------|---|
| | Prime factors of 72 are 2, 2, 2, 3, 3 Prime factors of 90 are 2, 3, 3, 5 | M1 | This mark is given for a method to find the prime factors of both 72 and 90 |
| | HCF = $2 \times 3 \times 3$ = 18 | A1 | This mark is given for the correct answer only |

Question 3 (Total 2 marks)

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---|------|---|
| | 36 2, 18 2, 2, 9 2, 2, 3, 3 | 1 | This mark is given for a complete method to find prime factors, which could be shown on a complete factor tree with no more than one arithmetic error |
| | $2 \times 2 \times 3 \times 3$ | 1 | This mark is given for the correct answer only |

Question 4 (Total 3 marks)

| Part | Working an or answer examiner might expect to see | Mark | Notes |
|------|--|------|---|
| | $108 = 2 \times 2 \times 3 \times 3 \times 3$ $120 = 2 \times 2 \times 2 \times 3 \times 5$ | M1 | This mark is given for a method to list the prime factors of 108 or 120 |
| | $2 \times 2 \times 3 \times 3 \times 3 \times 2 \times 5$ | M1 | This mark is given for a method to find the LCM of 108 and 120 |
| | 1080 | A1 | This mark is given for the correct answer only |

Question 5 (Total 4 marks)

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---|------|--|
| (a) | 40, 80, 120, 160, 200, 240, 280, ... 56, 112, 168, 224, 280, ... $40 = 2 \times 2 \times 2 \times 5 = 2^3 \times 5$ $56 = 2 \times 2 \times 2 \times 7 = 2^3 \times 7$ | M1 | This mark is given for listing at least 3 multiples of both 40 and 56 OR This mark is given for a correct method to write either 40 or 56 as a product of prime factors. |
| | $2^3 \times 5 \times 7 = 280$ | A1 | This mark is given for the correct answer only |
| (b) | $2^2 \times 3 \times 5 = 60$ | B1 | This mark is given for the correct answer only |

Question 6 (Total 3 marks)

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---|------|--|
| | $136 = 2 \times 68$ | M1 | This mark is given for a method to identify two correct factors |
| | $68 = 2 \times 34$ $34 = 2 \times 17$ | M1 | This mark is given for a method to the other correct prime factors |
| | $2 \times 2 \times 2 \times 17$ | A1 | This mark is given for the correct answer only |

Question 7 (Total 5 marks)

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---|------|---|
| (a) | 168 2×84 $2 \times 2 \times 42$ $2 \times 2 \times 2 \times 21$ | M1 | This mark is given for a method to find the prime factors (at least two steps seen) |
| | 2, 2, 2, 3, 7 | M1 | This mark is given for a correct list of factors seen |
| | $2^3 \times 3 \times 7$ or $2 \times 2 \times 2 \times 3 \times 7$ | A1 | This mark is given for a correct answer only |
| (b) | 2, 3, 4, 6, 7, 8, 12, 14, 21, 24, 28, 42, 56, 84 2, 3, 4, 6, 9, 10, 12, 15, 18, 20, 30, 45, 60, 90 or $168 = 2 \times 2 \times 2 \times 3 \times 7$ $180 = 2 \times 2 \times 3 \times 3 \times 5$ | M1 | This mark is given for lists of factors of 168 and 180 |
| | $2 \times 2 \times 3 = 12$ | A1 | This mark is given for the correct answer only |

Question 8 (Total 3 marks)

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|--|------|---|
| | $20 = 2 \times 2 \times 5$ $45 = 3 \times 3 \times 5$ $120 = 2 \times 2 \times 2 \times 3 \times 3 \times 5$ | P1 | This mark is given for a process to find the lowest common multiple (LCM) of 20, 45 and 120 |
| | LCM = $2 \times 2 \times 2 \times 3 \times 3 \times 5 = 360$ Number of seconds in an hour = 3600 | P1 | This mark is given for finding the LCM and the number of seconds in an hour |
| | $\frac{3600}{360} = 10$ | A1 | This mark is given for the correct answer only |

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Performance data:

| Q | Taken from | | | Total Marks available | TOPIC | Spec Ref | AO | % Mean marks | Edexcel mean averages Marks of candidates who achieved grade: | | | | | | | | | | |
|----|------------|------------|-------|-----------------------|--------|----------|----|--------------|--|--------------|--------------|--------------|--------------|-------------|------------|------------|----------|----------|-------------|
| | Q | Series | Paper | | | | | | ALL | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | U |
| 1 | 2 | June 2017 | 1H | 2 | Number | N2 | 1 | 83 | 1.66 | 1.95 | 1.89 | 1.81 | 1.72 | 1.59 | 1.35 | 1.01 | - | - | 0.58 |
| 2 | 3 | June 2019 | 1H | 2 | Number | N4 | 1 | 77 | 1.54 | 1.92 | 1.81 | 1.67 | 1.54 | 1.40 | 1.24 | 1.03 | - | - | 0.85 |
| 3 | 1 | Nov 2017 | 1H | 2 | Number | N4 | 1 | 65 | 1.29 | 2.00 | 1.76 | 1.74 | 1.63 | 1.56 | 1.43 | 1.19 | | | 0.76 |
| 4 | 1 | Nov 2019 | 1H | 3 | Number | N4 | 1 | 56 | 1.69 | 2.89 | 2.43 | 2.41 | 2.07 | 1.91 | 1.61 | 1.27 | - | - | 0.82 |
| 5a | 2a | June 2018 | 2H | 2 | Number | N4 | 1 | 73 | 1.46 | 1.93 | 1.80 | 1.64 | 1.48 | 1.32 | 1.12 | 0.92 | - | - | 0.67 |
| 5b | 2b | June 2018 | 2H | 1 | Number | N4 | 1 | 55 | 0.55 | 0.92 | 0.78 | 0.65 | 0.54 | 0.45 | 0.35 | 0.24 | - | - | 0.15 |
| 6 | 1 | Mock Set 4 | 1H | 3 | Number | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 7a | 1a | Mock Set 3 | 3H | 3 | Number | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 7b | 1b | Mock Set 3 | 3H | 2 | Number | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 8 | 10 | June 2018 | 3H | 3 | Number | N4 | 3 | 55 | 1.65 | 2.70 | 2.28 | 1.92 | 1.64 | 1.39 | 1.10 | 0.74 | - | - | 0.41 |
| | | | | 23 | | | | | 9.84 | 14.31 | 12.75 | 11.84 | 10.62 | 9.62 | 8.2 | 6.4 | - | - | 4.24 |