# 2019 Maths Arithmetic Paper Mark Scheme

Note that the questions in this paper have been rearranged by year group. In the table below, the first column donates the position in this paper, whereas the second column shows where the question was positioned in the original test paper.

| Question Number | Original question number | Domain | Answer(s) | Marks |
|---|---|---|---|---|
| 1 | **3** | 3N3 | 20 | **1m** |
| 2 | **4** | 3C4/3C1 | 336 | **1m** |
| 3 | **11** | 3C2 | 22<br>Do not accept -22 | **1m** |
| 4 | **12** | 3C4/3C1 | 8 | **1m** |
| 5 | **1** | 4N3a | 6,090 | **1m** |
| 6 | **2** | 4C2 | 8,357 | **1m** |
| 7 | **5** | 4C7 | 369 | **1m** |
| 8 | **7** | 4C6b | 60 | **1m** |
| 9 | **8** | 4C6a | 10 | **1m** |
| 10 | **9** | 4C6b | 0 | **1m** |
| 11 | **13** | 4C6b | 110 | **1m** |
| 12 | **19** | 4F8 | 4.75 | **1m** |
| 13 | **21** | 4F8 | 7.1 | **1m** |
| 14 | **6** | 5F8 | 8.993 | **1m** |
| 15 | **10** | 5C6a | 13 | **1m** |
| 16 | **16** | 5C5d | 27 | **1m** |
| 17 | **17** | 5C6b | 101,000 | **1m** |
| 18 | **34** | 5F5 | 17 ½ or equivalent (e.g. 70/4, 35/2, or 17.5) | **1m** |
| 19 | **35** | 5F5 | 450 | **1m** |
| 20 | **14** | 6F9a | 253.4 | **1m** |
| 21 | **15** | 6C9 | 10 | **1m** |
| 22 | **18** | 6R2 | 600<br>Do not accept 600% | **1m** |
| 23 | **20** | 6F9a | 0.009 | **1m** |
| 24 | **22** | 6F4 | $\frac{6}{7}$ (or equivalent) | **1m** |
| 25 | **23** | 6C7a | 22,572<br>If the answer is incorrect, award **ONE** mark for a formal method of long multiplication with no more than **ONE** arithmetic error | **2m** |
| 26 | **24** | 6F4 | 19/20 (or equivalent, including 0.95) | **1m** |
| 27 | **25** | 6C7b | 24<br>If the answer is incorrect, award **ONE** mark for a formal method of long multiplication with no more than **ONE** arithmetic error | **2m** |
| 28 | **26** | 6F4 | 3 3/10 (or equivalent, including 33/10 or 3.3) | **1m** |
| 29 | **27** | 6R2 | 112 | **1m** |

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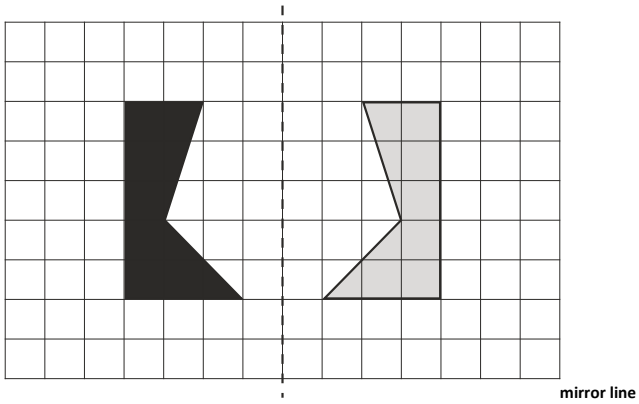
|---|---|---|---|---|
| | | | Do not accept 112% | |
| 30 | **28** | 6F4 | $\frac{23}{36}$ (or equivalent) | **1m** |
| 31 | **29** | 6R2 | 459<br>Do not accept 459% | **1m** |
| 32 | **30** | 6C7a | 215,016<br>If the answer is incorrect, award **ONE** mark for a formal method of long multiplication with no more than **ONE** arithmetic error | **2m** |
| 33 | **31** | 6F5b | $\frac{2}{9}$ (or equivalent) | **1m** |
| 34 | **32** | 6F4 | 1 ¾ (or equivalent, including 7/8, or 1.75) | **1m** |
| 35 | **33** | 6R2 | 162<br>Do not accept 162% | **1m** |
| 36 | **36** | 6C7b | 97<br>If the answer is incorrect, award **ONE** mark for a formal method of long multiplication with no more than **ONE** arithmetic error | **2m** |

# 2019 Maths Paper 2: Reasoning Mark Scheme

Note that the questions in this paper have been rearranged by year group. In the table below, the first column donates the position in this paper, whereas the second column shows where the question was positioned in the original test paper.

<table>
<tr><th>Question Number</th><th>Original question number</th><th>Domain</th><th>Answer(s)</th><th>Marks</th></tr>
<tr><td>1</td><td>1</td><td>3C6</td><td>Award one mark for all three correct answers:<br>4 x 8 = 32, 3 x 7 = 21, 4 x 3 = 12</td><td>1m</td></tr>
<tr><td>2</td><td>7</td><td>3M2c</td><td>$2.5$ or $2\frac{1}{2}$</td><td>1m</td></tr>
<tr><td>3</td><td>2</td><td>4N2b</td><td>8,072</td><td>1m</td></tr>
<tr><td>4</td><td>6</td><td>4F1/3C8</td><td>10</td><td>1m</td></tr>
<tr><td>5a</td><td>11a</td><td>4F6a</td><td>0.25</td><td>1m</td></tr>
<tr><td>5b</td><td>11b</td><td>4M9/3M9a</td><td>65(p) OR (£)0.65</td><td>1m</td></tr>
<tr><td>6</td><td>4</td><td>5P2</td><td>Diagram completed, as shown:<br>  <br></td><td>1m</td></tr>
<tr><td>7</td><td>9</td><td>4C3/5C7b</td><td>Award TWO marks for the correct answer of 124<br><br>If the answer is incorrect, award ONE mark for evidence of an appropriate method, e.g. 953 − 85 = 868 868 ÷ 7</td><td>2m</td></tr>
<tr><td>8</td><td>12</td><td>5F6b/5F6a</td><td>Both symbols correct, as shown:<br><br>$\frac{7}{10}$ 0.07 ><br><br>$\frac{23}{1000}$ < 0.23</td><td>1m</td></tr>
<tr><td>9</td><td>14</td><td>5N4</td><td>Award TWO marks for the correct completion of the three numbers in the table, as shown:<br><table><tr><th></th><th>Round 39,476</th></tr><tr><td>to the nearest 10,000</td><td>40,000</td></tr><tr><td>to the nearest 1,000</td><td>39,000</td></tr><tr><td>to the nearest 100</td><td>39,500</td></tr></table>If the answer is incorrect, award ONE mark for any two of the numbers rounded correctly.</td><td>Up to 2m</td></tr>
</table>

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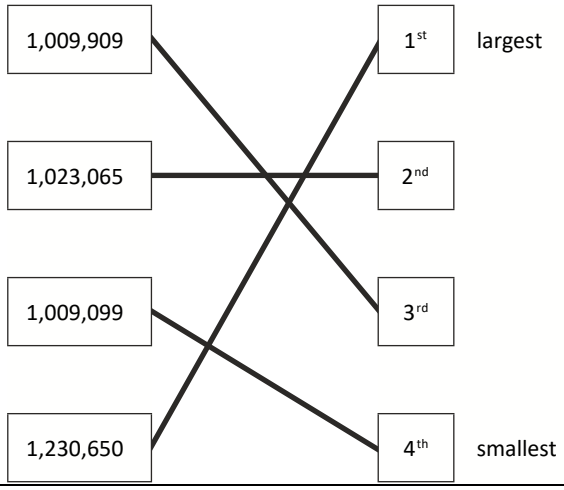
|---|---|---|---|---|
| 10 | **15** | 5F12/5S1 | 25 | **1m** |
| 11 | **18** | 5C5c | Award **ONE** mark for a correct explanation of why the 95 **AND** 87 are **NOT** prime, e.g.<br>• 87 is divisible by 3 and/or 29 **AND** 95 is divisible by 5 and/or 19<br>• 87 is in the 3 times table **AND** 95 is in the 5 times table<br>• 95 is divisible by five because every number in the five times table ends in five or zero. 87 is divisible by three because 9 is in the three times table so is ninety. Ninety minus three is 87<br>• 8 + 7 = 15 and 15 is divisible by 3 **AND** 95 is divisible by 5 | **1m** |
| 12 | **22a** | 5S2/3F1b | 2/5 (or equivalent) | **1m** |
| 13 | **3** | 6N2 | Award **ONE** mark for the four numbers matched correctly, as shown:<br>  <br> | **1m** |
| 14 | **5** | 5C1/6A3 | Award **TWO** marks for three correct numbers, as shown:<br>**110** 155 200 245 **290** **335**<br>Award **ONE** mark for:<br>• any two numbers correctly placed<br>**OR**<br>• if box 1 is correct, accept correct follow-through for box 3 from the incorrect value in box 2. | **Up to 2m** |
| 15a | **8a** | 6A3 | 11 written in the first box, as shown:<br>**11** 25 53 | **1m** |
| 15b | **8b** | 6A3 | 109 written in the last box, as shown:<br>25 53 **109** | **1m** |
| 16 | **10** | 6A2/6C9 | Second box only ticked correctly, as shown:<br>number of tickets × 24 + 3 ✓ | **1m** |
| 17 | **13** | 6G3a | Award **TWO** marks for a completed triangle that has **all** of the following three points:<br>• an angle in the range 33° to 37° inclusive for the angle marked 35°<br>• an angle in the range 88° to 92° inclusive for the right angle | **Up to 2m** |

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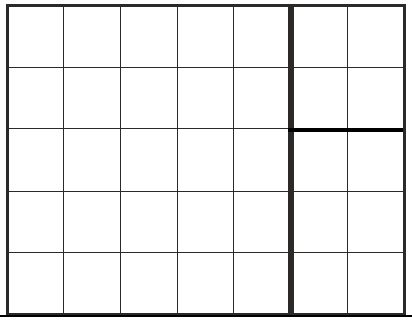
| | | | • the triangle has been drawn on an 8cm line (either on the given line or a line drawn), provided they have constructed both angles within the tolerance of the line 7.9cm to 8.1cm.<br><br>If the answer is incorrect, award **ONE** mark for a completed triangle and two of the three points correct. | |
| 18 | **16** | 6C9 | 4 | **1m** |
| 19 | **17** | 6M7a/5M7b | Award **TWO** marks for the correct answer of 144<br><br>If the answer is incorrect, award **ONE** mark for evidence of an appropriate method | **2m** |
| 20 | **19** | 6R1/6M5 | Award **TWO** marks for the correct answer of 3.75<br><br>If the answer is incorrect, award **ONE** mark for evidence of an appropriate method | **2m** |
| 21 | **20** | 6F11 | Award **TWO** marks for two boxes ticked correctly, as shown:<br>$\frac{1}{20}$ ☐<br>$\frac{20}{40}$ ☐<br>$\frac{1}{5}$ ☑<br>$\frac{3}{15}$ ☑<br>$\frac{2}{100}$ ☐<br><br>If the answer is incorrect, award **ONE** mark for:<br>• only one box ticked correctly and no incorrect boxes ticked<br>• two boxes ticked correctly and one incorrect box ticked. | **Up to 2m** |
| 22 | **21** | 6G3a/5C5d | Rectangle divided, as shown or equivalent reflection:<br>  | **1m** |
| 23 | **22b** | 6S3/5F10 | Award **TWO** marks for the correct answer of 10.7<br>If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, e.g.<br>• 8.1 + 9.3 + 11.9 + 11.8 + 12.4 = 53.5 53.5 ÷ 5 | **Up to 2m** |
| 24 | **23** | 6M8a/6C8 | 720<br>If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, e.g. | **2m** |

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| | | | • 3 × 4 × 6 = 72<br>8 × 9 × 11 = 792<br>792 – 72 =<br><br>Award **ONE** mark for sight of 792 | |

# 2019 Maths Paper 3: Reasoning 2 Mark Scheme

Note that the questions in this paper have been rearranged by year group. In the table below, the first column donates the position in this paper, whereas the second column shows where the question was positioned in the original test paper.

| Question Number | Original question number | Domain | Answer(s) | Marks |
|---|---|---|---|---|
| 1 | **5** | 3C4/3N3 | Addition completed, as shown<br>**1** 2 **8** + **7** 2 = 2 0 0 | **1m** |
| 2 | **14** | 3M4e | 91 | **1m** |
| 3 | **1** | 4N2b/3N2b | £7,899 | **1m** |
| 4 | **6** | 4F10b/4M9 | Award **TWO** marks for the correct answer of £6.87<br>If the answer is incorrect, award **ONE** mark for evidence of an appropriate method. | **2m** |
| 5 | **7a** | 3M1b/4S2 | 155 | **1m** |
| 6 | **8** | 4C4/4C2 | Award **TWO** marks for the correct answer of 1,356<br>If the answer is incorrect, award **ONE** mark for evidence of an appropriate method. | **Up to 2m** |
| 7 | **9** | 4S2/4N4a | 2,250 | **1m** |
| 8 | **13** | 4G4 | An explanation that includes a correct counter example, e.g. When you double 10° it is not obtuse, or 2 × 27° = 54°, or Double 45° is a right angle not obtuse.<br>Or<br>An explanation that demonstrates where the statement in the question is not correct, e.g. If the acute angle is less than 45° then doubling it will be less than 90°, so it won't be obtuse (more than 90°). | **1m** |
| 9 | **4** | 5F8/3M1b | Masses in correct order, as shown:<br>**0.009 kg** **0.99 kg** **1.025 kg** **1.25 kg**<br>**lightest** | **1m** |
| 10 | **7b** | 5S1 | Table completed with three correct numbers, as shown:<br>**Mass in g** / **Number of kittens**<br>250–299 / **2**<br>300–349 / **3**<br>350–399 / **2**<br>400–449 / 1 | **1m** |
| 11 | **16** | 5M9c/5M9a | Award **TWO** marks for the correct answer of £1.85. | **Up to 2m** |

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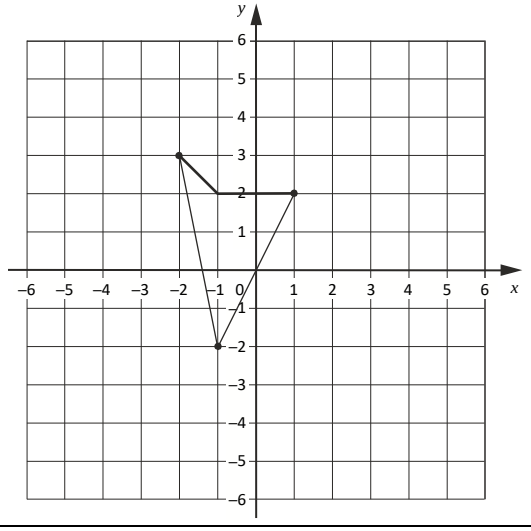
|---|---|---|---|---|
| | | | If the answer is incorrect, award **ONE** mark for evidence of an appropriate method. | |
| 12 | **18** | 5F3 | Award **TWO** marks for three boxes ticked correctly:<br>$\frac{1}{2}$ ☑<br>$\frac{2}{8}$ ☑<br>$\frac{3}{4}$ ☐<br>$\frac{7}{16}$ ☑<br>$\frac{24}{32}$ ☐<br>Award **ONE** mark for:<br>• only two boxes ticked correctly and no incorrect boxes ticked<br>**OR**<br>three boxes ticked correctly and one incorrect box ticked. | **Up to 2m** |
| 13a | **21a** | 5G2a/4P3a | **B** is (55, 30) | **1m** |
| 13b | **21b** | 5G2a/4P3a | **D** is (55, 14)<br>If B and D are incorrect, **ONE** mark may be given for the correct $y$ coordinate for both B and D and the same $x$ coordinate (incorrect) for both points, i.e. D is (same $x$ as B, 14) | **1m** |
| 14a | **2a** | 6N3 | 7 | **1m** |
| 14b | **2b** | 6N4 | 4,000,000 | **1m** |
| 15 | **3** | 6A1 | Award **ONE** mark for the correct box ticked, as shown:<br>$10 - a$ ☑ $a$ | **1m** |
| 16a | **10a** | 6P3/4P3b | Quadrilateral completed, as shown:<br>  | **1m** |
| 16b | **10b** | 6P2/5P2 | Quadrilateral translated correctly, as shown: | **1m** |

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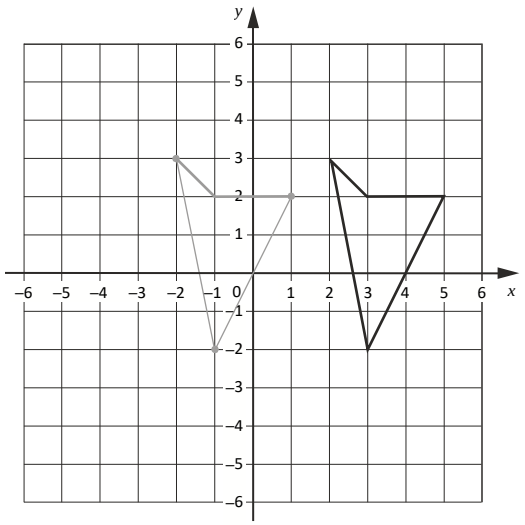
|---|---|---|---|---|
| | | |  | |
| 17 | **11** | 6C5 | Award two marks for all four numbers correctly placed each time, or award one mark for three numbers correctly placed each time.<br>Number 3 = prime, factor of 12, factor of 15<br>Number 4 = factor of 12<br>Number 5 = prime, factor of 15<br>Number 6 = factor of 12 | **Up to 2m** |
| 18 | **12** | 6R3/5M9b | Award **ONE** mark for two correct answers, as shown:<br>length = **19 cm**<br>width = **9.1 cm** | **1m** |
| 19 | **15** | 6M6/6R1 | 400 | **1m** |
| 20 | **17** | 6A4 | Award **ONE** mark for any pair of whole numbers less than 10 that satisfy the equation, i.e. $x$ = 8 **AND** $y$ = 6<br>**OR**<br>$x$ = 6 **AND** $y$ = 7<br>**OR**<br>$x$ = 4 **AND** $y$ = 8<br>**OR**<br>$x$ = 2 **AND** $y$ = 9 | **1m** |
| 21 | **19** | 6C8 | Award **THREE** marks for the correct answer of 7,174<br>If the answer is incorrect, award **TWO** marks for evidence of an appropriate complete method which contains no more than one arithmetic error.<br>Award **ONE** mark for evidence of an appropriate method with more than one arithmetic error.<br>**OR**<br>• sight of 3,604 as evidence of long multiplication step (68 × 53) completed correctly. | **Up to 3m** |

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| | | | **OR**<br>sight of 3,570 as evidence of long multiplication step (105 × 34) completed correctly. | |
| 22 | **20** | 6C7b/6C8 | Award **TWO** marks for the correct answer of 29<br><br>If the answer is incorrect, award **ONE** mark for evidence of an appropriate method. | **Up to 2m** |
| 23 | **22** | 6G2a/5G2a | 10.5 (cm) | **1m** |
| 24 | **23** | 6R1 | An explanation that gives the correct values for PQ and/or QR, e.g. PQ = 640m, or QR is 160, 160 times 4 is not 600m.<br>**OR**<br>An explanation recognising PR is 800m and must be 5 times QR<br>**OR**<br>An explanation that PQ is not 600m, e.g. if it was 600m then the shorter distance would be 200m if added to make 800m, 600m is 3 times 200, not 4 times. | **1m** |