Band 7 – Test 1 Answers

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| 1. | F: √3 x √3 = 3  O: √3 x √2 = √6  I: -√2 x √3 = -√6  L: -√2 x √2 = 2  3 + √6 - √6 – 2 = 3 – 2 = 1 | 1 mark for at least 3 correct terms from expansion  1 mark for attempt to simplify  1 mark for correct answer | 3 |
| 2. |  | 1 mark for multiplying numerator and denominator by √6  1 mark for correct answer | 2 |
| 3. | + = 2  + = 2  6 + 3 = 4x  = x | 1 mark for calculating a common denominator  1 mark for 4x seen  1 mark for correct answer oe | 3 |
| 4. | + = 1  = 1  x² + x + 8x – 12 = 2x² + 2x – 3x – 3  0 = x² - 10x + 9  0 = (x – 9)(x – 1)  x = 9 or 1 | 1 mark for calculating a common denominator  1 mark for = 0 seen  1 mark for correct factorisation  1 mark for correct answer oe | 4 |
| 5. |  | 2 marks for each correct graph drawn | 4 |

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| 6. | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **x** | -2 | -1 | 0 | 1 | 2 | 3 | 4 | | **y** | 11 | **5** | 1 | -1 | **-1** | **1** | 5 |     (1.5, -1.2 ≤ y ≤ -1.6) | 2 marks for all y values correct  (1 mark for at least 2 y values correct)  1 mark for all coordinates plotted correctly  1 mark for smooth graph  1 mark for correct turning point | 5 |
| 7. | (x + 3)² - 9 = 4  (x + 3)² = 13  x = -3 ± √13 | 1 mark for (x + 3)² seen  1 mark for -9 seen  1 mark for correct answer | 3 |
| 8. | Coordinates identified:  (-1, -1), (0, -1), (0, 0), (1, -1), (1, 0), (1, 1) | 1 mark for each inequality plotted correctly (including solid or dotted line and shading)  1 mark for correct coordinates identified | 4 |
| 9. | ACB = 27°  Tangent and radius are perpendicular  BAC = 63°  Angles in alternate segments are equal | 1 mark for each correct answer  1 mark for each correct reason | 4 |
| 10. | PR² = 7² + 10² - 2 x 7 x 10 x cos64  = 87.628039…  PR = 9.3609849… = 9.36 cm | 1 mark for correct substitution into cosine rule  1 mark for √ seen  1 mark for correct answer | 3 |

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| 11. | sin(X) = sin83  4 6.5  sin(X) = 4 x sin83 = 0.6107976…  6.5  X = sin-1(0.610…) = 37.647199… = 37.6° | 1 mark for correct substitution into sine rule  1 mark for sin-1 seen  1 mark for correct answer | 3 |
| 12. | = + = -a + b  = + = a + (b – a) = a + b | 1 mark for correct answer  1 mark for and oe seen  1 mark for correct answer | 3 |
| 13. |  | 1 mark for a line starting from (0, 0)  1 mark for a line with gradient ½ or intersecting (20, 10)  1 mark for a horizontal line from (20, 10) to (50, 10) | 3 |

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| 14. | |  |  |  | | --- | --- | --- | | **Height (h cm)** | **Frequency** | **Cumulative frequency** | | 170 ≤ h < 175 | 5 | **5** | | 175 ≤ h < 180 | 18 | **23** | | 180 ≤ h < 185 | 12 | **35** | | 185 ≤ h < 190 | 4 | **39** | | 190 ≤ h < 195 | 1 | **40** | | 1 mark for cumulative frequency column filled in correctly  1 mark for coordinates plotted at endpoint of each category  1 mark for coordinates joined with smooth curve  1 mark for median between 177 and 179 cm | 4 |

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| 15. | |  | | --- | | Mark | | Lowest mark | 5 | | Lower quartile | **10** | | Median | 30 | | Upper quartile | 35 | | Highest mark | 55 | | 1 mark for median at 30 on diagram  1 mark for upper quartile at 55 on diagram  1 mark for lower quartile at 10 in table | 3 |