Band 7 – Test 3 Answers

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| 1. | F: 2 x 7 = 14  O: 2 x -√3 = -2√3  I: √3 x 7 = 7√3  L: √3 x -√3 = -3  14 - 2√3 + 7√3 - 3 = 11 + 5√3 | 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 √20  1 mark for correct answer | 2 |
| 3. | + = 10  = 10  2x + 2 + 3x + 9 = 60  5x = 49  x = 9.8 | 1 mark for calculating a common denominator  1 mark for 5x seen  1 mark for correct answer oe (fraction accepted) | 3 |
| 4. | + = 5  = 5  6x + 9 + 2x – 2 = 5(2x² + x – 3)  0 = 10x² - 3x – 22  = 1.64 or -1.34 | 1 mark for calculating a common denominator  1 mark for = 0 seen  1 mark for substitution into quadratic formula  1 mark for correct answer oe | 4 |

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| 5. |  | 2 marks for y = f(x – 4)  (1 mark for 4 seen)  2 marks for correct graph drawn | 4 |

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| 6. | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **x** | -2 | -1 | 0 | 1 | 2 | 3 | 4 | | **y** | 4 | **-1** | -4 | -5 | **-4** | -1 | **4** |     (1, 5) | 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 |

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| 7. | (x - 1)² - 1 – 1 = (x - 1)² - 2 | 1 mark for (x - 1)² seen  2 marks for (x - 1)² - 2  (1 mark for -2) | 3 |
| 8. |  | 1 mark for each inequality plotted correctly (including solid or dotted line and shading)  1 mark for correct region identified | 4 |
| 9. | BAD = 90° because angles in a semi-circle are right angles  CBD = 35° because angles at the circumference are half at the centre | 1 mark for each correct answer  1 mark for each correct reason | 4 |

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| 10. | QR² = 8.5² + 7² - (2 x 8.5 x 7 x cos94)  = 129.55102…  QR = 11.38204… = 11.4 cm | 1 mark for correct substitution into cosine rule  1 mark for √ seen  1 mark for correct answer | 3 |
| 11. | sinZ = sin41  3.7 2.5  sinZ = 3.7sin41 = 0.97096…  2.5  Z = sin-1(0.97096…) = 76.15996… = 76.2° | 1 mark for correct substitution into sine rule  1 mark for sin-1  1 mark for correct answer | 3 |
| 12. | = -c + a + 2c = a + c  = + = ¼(2c) – a – c = ½c – a – c = -a – ½c | 1 mark for or calculated  1 mark for calculated  1 mark for correct answer | 3 |
| 13. |  | 1 mark for a line segment from (0, 0) to (10, 8)  1 mark for a line segment from (10, 8) to (60, 8)  1 mark for a line segment from (60, 8) to (100, 0) | 3 |

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| 14. | |  |  |  | | --- | --- | --- | | **Age (t years)** | **Frequency** | **Cumulative frequency** | | 15 ≤ t < 20 | 95 | **95** | | 20 ≤ t < 25 | 90 | **185** | | 25 ≤ t < 30 | 35 | **220** | | 30 ≤ t < 35 | 15 | **235** | | 35 ≤ t < 40 | 5 | **240** | | 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 20 and 23 years | 4 |

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| 15. |  | 1 mark correct median  1 mark for correct upper quartile and lower quartile  1 mark for correct minimum and maximum | 3 |