Band 7 – Test 2 Answers

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| 1. | F: 2 x 1 = 2  O: 2 x √3 = 2√3  I: √3 x 1 = √3  L: √3 x √3 = 3  2 + 2√3 + √3 + 3 = 5 + 3√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 √8  1 mark for oe | 2 |
| 3. | - =  =  3x – 9 – 4x – 12 = 5x  -6x = 21  x = -3.5 | 1 mark for calculating a common denominator  1 mark for 6x or -6x seen  1 mark for correct answer oe | 3 |
| 4. | + = 2  = 2  6x – 3 + 5x + 10 = 2(2x² + 3x – 2)  0 = 4x² - 5x – 11  = 2.40 or -1.15 | 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. | y = f(x – 4) | 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** | 0 | 1 | 2 | 3 | 4 | 5 | 6 | | **y** | 0 | **36** | **56** | 60 | **48** | **20** | -24 |     (2.75, 60.5) | 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  (2.5 ≤ x ≤ 3, 60 ≤ y ≤ 62) | 5 |

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| 7. | (x - 7)² + 49  a = 49  b = -7 | 1 mark for (x - 7)² seen  1 mark for a = 49  1 mark for b = -7 | 3 |
| 8. |  | 1 mark for each inequality plotted correctly (including solid or dotted line and shading)  1 mark for correct region identified | 4 |
| 9. | ADC = 60°  ADB = 35°  Angles in a semi-circle are 90°. 90 – 25 = 65° so Ben is correct | 1 mark for each correct answer  1 mark for correct reason  1 mark for correct conclusion | 4 |
| 10. | cosQ = 3.5² + 5² - 6.5²  2 x 3.5 x 5  Q = cos-1 (-5 ÷ 35) = 109.125789… = 109° | 1 mark for correct substitution into cosine rule  1 mark for cos-1 seen  1 mark for correct answer | 3 |

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| 11. | \_XY\_ = \_\_9\_\_  sin62 sin76  XY = 9 x sin62 = 8.189800… = 8.19 cm  sin76 | 1 mark for correct substitution into sine rule  1 mark for multiplying by sin62  1 mark for correct answer | 3 |
| 12. | = = 2(b – a) = 2b – 2a  = + = a + (2b – 2a) = b – 3a | 1 mark for correct answer  1 mark for any section of correctly calculated  1 mark for correct answer | 3 |
| 13. |  | 1 mark for a line segment from (0, 10) to (12, 3)  1 mark for a line segment from (12, 3) to (27, 3)  1 mark for a line segment from (27, 3) to (35, 0) | 3 |

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| 14. | |  |  |  | | --- | --- | --- | | **Time (t hours)** | **Frequency** | **Cumulative frequency** | | 50 ≤ t < 55 | 12 | **12** | | 55 ≤ t < 60 | 21 | **33** | | 60 ≤ t < 65 | 36 | **69** | | 65 ≤ t < 70 | 23 | **92** | | 70 ≤ t < 75 | 8 | **100** | | 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 61 and 63 hours | 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 |