Band 7 – Test 2 Answers

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| 1. | F: 2 x 1 = 2O: 2 x √3 = 2√3I: √3 x 1 = √3L: √3 x √3 = 32 + 2√3 + √3 + 3 = 5 + 3√3 | 1 mark for at least 3 correct terms from expansion1 mark for attempt to simplify1 mark for correct answer | 3 |
| 2. | $\frac{2}{\sqrt{8}} x \frac{\sqrt{8}}{\sqrt{8}}= \frac{2\sqrt{8}}{8}= \frac{\sqrt{8}}{4}= \frac{2\sqrt{2}}{4}= \frac{\sqrt{2}}{2}$  | 1 mark for multiplying numerator and denominator by √81 mark for $\frac{\sqrt{8}}{4}$ oe | 2 |
| 3. |  $\frac{3}{x+3}$ - $\frac{4}{x-3}$ = $\frac{5x}{x^{2}-9}$ $\frac{3\left(x-3\right)-4(x+3)}{(x+3)(x-3)}$ = $\frac{5x}{(x+3)(x-3)}$3x – 9 – 4x – 12 = 5x  -6x = 21 x = -3.5 | 1 mark for calculating a common denominator1 mark for 6x or -6x seen1 mark for correct answer oe | 3 |
| 4. |  $\frac{3}{x+2}$ + $\frac{5}{2x-1}$ = 2 $\frac{3\left(2x-1\right)+5(x+2)}{(x+2)(2x-1)}$ = 2 6x – 3 + 5x + 10 = 2(2x² + 3x – 2) 0 = 4x² - 5x – 11$x=\frac{--5\pm \sqrt{(-5)^{2}-4(4)(-11)}}{2(4)}$ = 2.40 or -1.15 | 1 mark for calculating a common denominator1 mark for = 0 seen1 mark for substitution into quadratic formula1 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. |

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| **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 correctly1 mark for smooth graph1 mark for correct turning point (2.5 ≤ x ≤ 3, 60 ≤ y ≤ 62) | 5 |

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| 7. | (x - 7)² + 49a = 49b = -7 | 1 mark for (x - 7)² seen1 mark for a = 491 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 answer1 mark for correct reason1 mark for correct conclusion | 4 |
| 10. | cosQ = 3.5² + 5² - 6.5² 2 x 3.5 x 5Q = cos-1 (-5 ÷ 35) = 109.125789… = 109° | 1 mark for correct substitution into cosine rule1 mark for cos-1 seen1 mark for correct answer | 3 |

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| 11. | \_XY\_ = \_\_9\_\_sin62 sin76XY = 9 x sin62 = 8.189800… = 8.19 cm sin76 | 1 mark for correct substitution into sine rule1 mark for multiplying by sin621 mark for correct answer | 3 |
| 12. | $→$ = $2\left(→\right)$ = 2(b – a) = 2b – 2a$→$ = $→$ + $2\left(→\right)$ = a + $2$(2b – 2a) = $4$b – 3a | 1 mark for correct answer1 mark for any section of $→$ correctly calculated1 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. |

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| **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 correctly1 mark for coordinates plotted at endpoint of each category1 mark for coordinates joined with smooth curve1 mark for median between 61 and 63 hours | 4 |

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| 15. |   | 1 mark correct median1 mark for correct upper quartile and lower quartile1 mark for correct minimum and maximum | 3 |