Band 7 – Test 3 Answers

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| 1. | F: 2 x 7 = 14O: 2 x -√3 = -2√3I: √3 x 7 = 7√3L: √3 x -√3 = -314 - 2√3 + 7√3 - 3 = 11 + 5√3 | 1 mark for at least 3 correct terms from expansion1 mark for attempt to simplify1 mark for correct answer | 3 |
| 2. | $\frac{4}{\sqrt{20}} x \frac{\sqrt{20}}{\sqrt{20}}= \frac{4\sqrt{20}}{20}= \frac{8\sqrt{5}}{20}= \frac{2\sqrt{5}}{5}$  | 1 mark for multiplying numerator and denominator by √201 mark for correct answer | 2 |
| 3. |  $\frac{x+1}{3}$ + $\frac{x+3}{2}$ = 10 $\frac{2\left(x+1\right)+3(x+3)}{6}$ = 102x + 2 + 3x + 9 = 60 5x = 49 x = 9.8 | 1 mark for calculating a common denominator1 mark for 5x seen1 mark for correct answer oe (fraction accepted) | 3 |
| 4. |  $\frac{3}{x-1}$ + $\frac{2}{2x+3}$ = 5 $\frac{3\left(2x+3\right)+2(x-1)}{(x-1)(2x+3)}$ = 56x + 9 + 2x – 2 = 5(2x² + x – 3) 0 = 10x² - 3x – 22$x=\frac{-(-3)\pm \sqrt{(-3)^{2}-4(10)(-22)}}{2(10)}$ = 1.64 or -1.34 | 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. |  | 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** | -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 correctly1 mark for smooth graph1 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 seen2 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 anglesCBD = 35° because angles at the circumference are half at the centre | 1 mark for each correct answer1 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 rule1 mark for √ seen1 mark for correct answer | 3 |
| 11. | sinZ = sin413.7 2.5sinZ = 3.7sin41 = 0.97096… 2.5Z = sin-1(0.97096…) = 76.15996… = 76.2° | 1 mark for correct substitution into sine rule1 mark for sin-11 mark for correct answer | 3 |
| 12. | $→$ = -c + a + 2c = a + c$→$ = $→$ + $→$ = ¼(2c) – a – c = ½c – a – c = -a – ½c  | 1 mark for $→$ or $→$ calculated1 mark for $→$calculated1 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. |

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| **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 correctly1 mark for coordinates plotted at endpoint of each category1 mark for coordinates joined with smooth curve1 mark for median between 20 and 23 years | 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 |