Band 7 – Test 1 Answers

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| 1. | F: √3 x √3 = 3O: √3 x √2 = √6I: -√2 x √3 = -√6L: -√2 x √2 = 23 + √6 - √6 – 2 = 3 – 2 = 1 | 1 mark for at least 3 correct terms from expansion1 mark for attempt to simplify1 mark for correct answer | 3 |
| 2. | $\frac{2}{\sqrt{6}} x \frac{\sqrt{6}}{\sqrt{6}}= \frac{2\sqrt{6}}{6}= \frac{\sqrt{6}}{3}$  | 1 mark for multiplying numerator and denominator by √61 mark for correct answer | 2 |
| 3. |  $\frac{3}{x}$ + $\frac{3}{2x}$ = 2$\frac{6}{2x}$ + $\frac{3}{2x}$ = 2 6 + 3 = 4x $\frac{9}{4}$ = x | 1 mark for calculating a common denominator1 mark for 4x seen1 mark for correct answer oe | 3 |
| 4. |  $\frac{x}{2x-3}$ + $\frac{4}{x+1}$ = 1 $\frac{x\left(x+1\right)+4(2x-3)}{(2x-3)(x+1)}$ = 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 denominator1 mark for = 0 seen1 mark for correct factorisation1 mark for correct answer oe | 4 |
| 5. |  | 2 marks for each correct graph drawn | 4 |

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| 6. |

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| **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 correctly1 mark for smooth graph1 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 seen1 mark for -9 seen1 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 perpendicularBAC = 63°Angles in alternate segments are equal | 1 mark for each correct answer1 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 rule1 mark for √ seen1 mark for correct answer | 3 |

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| 11. | sin(X) = sin83 4 6.5sin(X) = 4 x sin83 = 0.6107976… 6.5X = sin-1(0.610…) = 37.647199… = 37.6° | 1 mark for correct substitution into sine rule1 mark for sin-1 seen1 mark for correct answer | 3 |
| 12. | $→$ = $→$ + $→$ = -a + b$→$ = $→$ + $\frac{2}{3}→$ = a + $\frac{2}{3}$ (b – a) = $\frac{1}{3}$ a + $\frac{2}{3}$ b | 1 mark for correct answer1 mark for $→$ and $→$ oe seen1 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. |

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| **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 correctly1 mark for coordinates plotted at endpoint of each category1 mark for coordinates joined with smooth curve1 mark for median between 177 and 179 cm | 4 |

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| 15. |

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| Mark |
| Lowest mark | 5 |
| Lower quartile | **10** |
| Median | 30 |
| Upper quartile | 35 |
| Highest mark | 55 |

  | 1 mark for median at 30 on diagram1 mark for upper quartile at 55 on diagram1 mark for lower quartile at 10 in table | 3 |