Bands 4 – 6 Problem Solving – Test 1 Answers

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | 2 x 3 = 62 + 3 = 5(x + 2)(x + **3**) = x² + **5**x + 68 – 3 = 53 x 8 = 24(x - **3**)(x + 8) = x² + 5x - **24** | 1 mark for 2 x 3 oe1 mark for 2 + 3 oe1 mark for each correct gap1 mark for 8 – 3 oe1 mark for 3 x 8 oe1 mark for each correct gap | 8 |

|  |  |  |  |
| --- | --- | --- | --- |
| 2. |  | 4 marks for all correct coordinates in table of values (3 marks for at least 9, 2 marks for at least 6, 1 mark for at least 3 correct)2 marks for 4 coordinates identified as incorrect (1 mark for at least 2) | 6 |

|  |  |  |  |
| --- | --- | --- | --- |
| 3. | a x $1.3^{7}$ = 3500a = 3500 ÷ $1.3^{7}$ = 557.782… = 558 insects | 1 mark for $1.3^{7}$ seen1 mark for identifying 3500 as the outcome1 mark for dividing1 mark for 557 seen1 mark for correct answer | 5 |
| 4. | ½ x 5 x 5 x sin68 = 11.5897… = 11.6 cm² | 1 mark for correct substitution into ½ ab sinC1 mark for 11 seen1 mark for correct answer | 3 |
| 5. | 2 x 7 = 14 cm diameter9 = $\frac{x}{360}$ x 14 x $π$x = 9 x 360 ÷ 14 ÷ $π$ = 73.6660022… = 73.7° | 1 mark for calculating diameter1 mark for substituting into formula1 mark for x 360, ÷ 14 or ÷ $π$1 mark for 73 seen1 mark for correct answer | 5 |
| 6. | P α d0.8 = k x 8k = 0.1P = 0.1dP = 0.1 x 75 = 7.5 barsYes, the watch will still work | 1 mark for proportion sentence1 mark for substitution to find k1 mark for formula written1 mark for substitution into formula1 mark for 7.5 bars seen1 mark for correct conclusion | 6 |
| 7. | y = x – 1 and y = ½x + 7  x – 1 = ½x + 72x – 2 = x + 14 x = 16 y = x – 1 = 16 – 1 = 15(16, 15) | 1 mark for each equation written1 mark for equation set up for both graphs1 mark for x calculated1 mark for x substituted1 mark for y calculated1 mark for correct answer | 7 |
| 8. | To calculate 2nd pair:a + b = 1a – b = 2 +2a = 3\_So a = 1.5 and b = -0.5 🡪 (1.5, -0.5)To calculate 1st pair:a + b = 1.5a – b = -0.5 +2a = 1\_\_\_\_So a = 0.5 and b = 1 🡪 (0.5, 1)To calculate 6th pair:2 + 4 = 6 and 2 – 4 = -2 🡪 (6, -2) | 1 mark for 2 equations for 2nd coordinate1 mark for x1 mark for y1 mark for 2 equations for 1st coordinate1 mark for x1 mark for y1 mark for 6th coordinate | 7 |