Bands 5 – 7 Problem Solving – Test 3 Answers

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| 1. | 2.5 x 1.5³ = 8.4375 L | 1 mark for 1.5³ seen1 mark for correct answer | 2 |
| 2. | 1 ml = 1 cm³$\frac{4}{3} π$ r³ = 20(÷$\frac{4}{3}$, ÷ $π$, $\sqrt[3]{}$)r = 1.6838… cm = 17 ml | 1 mark for equation set up for volume1 mark for ÷$\frac{4}{3}$, ÷ $π$ or $\sqrt[3]{}$ seen1 mark for 1.68… seen1 mark for correct answer | 4 |
| 3. | h x 1.05 x 1.02 = 171 360171 360 ÷ 1.071 = £160 000 | 1 mark for 1.05 seen1 mark for 1.02 seen1 mark for ÷ 1.0711 mark for correct answer | 4 |
| 4. | u = 10, a = 0.6, t = 20s = (10 x 20) + (1/2 x 0.6 x 20²) = 200 + 120 = 320 m | 1 mark for u, a and t found1 mark for substitution into formula1 mark for 200 or 120 seen1 mark for correct answer | 4 |
| 5. | t α $\frac{1}{p}$400 = $\frac{k}{1500}$k = 600 000t = $\frac{600 000}{p}$t = $\frac{600 000}{2500}$ = 240 seconds = 4 minutesNo, it will be over 3 minutes | 1 mark for proportion sentence1 mark for t and p substituted1 mark for k calculated1 mark for p substituted1 mark for correct answer in seconds or minutes1 mark for correct conclusion | 6 |

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| 6. | a) 3 = (3 x 0) – 3 Nob) (4 x 3) – (8 x 0) = 12 Yesc) (5 x 3) = (3 x 0) – 15 Nod) (2 x 0) – 3 = 3 Noe) (3 x 0) + 3 = 3 Yesb and d pass through (0, 3) | 1 mark for each correct calculation | 5 |
| 7. | LN is common, butKN ≠ NMKL ≠ LM | 1 mark for each statement | 3 |
| 8. |  (2x + 5)(2x + 4) – 20 = 104x² + 10x + 8x + 20 – 20 – 10 = 0 4x² + 18x – 10 = 0 2x² + 9x – 5 = 0 (2x – 1)(x + 5) = 0x = ½ or -5 (cannot be negative)x = ½ m | 1 mark for equation written1 mark for brackets expanded1 mark for simplified1 mark for factorised1 mark for solved1 mark -5 not possible1 mark for correct answer | 7 |

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| 9. | a) $x^{2}- \frac{x(x-y)}{2}$ b) $\frac{x(x-1/2x)}{2}$ = ¼ x² 25% not shaded, so 75% shadedc) y = 0 x² - ½ x² = ½ x² 50% shadedd) The minimum shaded area corresponds with the largest possible triangle. | 1 mark for x²1 mark for correct answer1 mark for substituting ½ x1 mark for x²/4 or ¼ x² seen1 mark for correct answer1 mark for y = 01 mark for x² - ½ x²1 mark for ½ x²1 mark for correct answer1 mark for correct explanation | 10 |