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 seen  1 mark for correct answer | 2 |
| 2. | 1 ml = 1 cm³  r³ = 20  (÷, ÷ , )  r = 1.6838… cm = 17 ml | 1 mark for equation set up for volume  1 mark for ÷, ÷ or seen  1 mark for 1.68… seen  1 mark for correct answer | 4 |
| 3. | h x 1.05 x 1.02 = 171 360  171 360 ÷ 1.071 = £160 000 | 1 mark for 1.05 seen  1 mark for 1.02 seen  1 mark for ÷ 1.071  1 mark for correct answer | 4 |
| 4. | u = 10, a = 0.6, t = 20  s = (10 x 20) + (1/2 x 0.6 x 20²)  = 200 + 120  = 320 m | 1 mark for u, a and t found  1 mark for substitution into formula  1 mark for 200 or 120 seen  1 mark for correct answer | 4 |
| 5. | t α  400 =  k = 600 000  t =  t = = 240 seconds = 4 minutes  No, it will be over 3 minutes | 1 mark for proportion sentence  1 mark for t and p substituted  1 mark for k calculated  1 mark for p substituted  1 mark for correct answer in seconds or minutes  1 mark for correct conclusion | 6 |

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| 6. | a) 3 = (3 x 0) – 3 No  b) (4 x 3) – (8 x 0) = 12 Yes  c) (5 x 3) = (3 x 0) – 15 No  d) (2 x 0) – 3 = 3 No  e) (3 x 0) + 3 = 3 Yes  b and d pass through (0, 3) | 1 mark for each correct calculation | 5 |
| 7. | LN is common, but  KN ≠ NM  KL ≠ LM | 1 mark for each statement | 3 |
| 8. | (2x + 5)(2x + 4) – 20 = 10  4x² + 10x + 8x + 20 – 20 – 10 = 0  4x² + 18x – 10 = 0  2x² + 9x – 5 = 0  (2x – 1)(x + 5) = 0  x = ½ or -5 (cannot be negative)  x = ½ m | 1 mark for equation written  1 mark for brackets expanded  1 mark for simplified  1 mark for factorised  1 mark for solved  1 mark -5 not possible  1 mark for correct answer | 7 |

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| 9. | a)  b) = ¼ x²  25% not shaded, so 75% shaded  c) y = 0  x² - ½ x² = ½ x²  50% shaded  d) The minimum shaded area corresponds with the largest possible triangle. | 1 mark for x²  1 mark for correct answer  1 mark for substituting ½ x  1 mark for x²/4 or ¼ x² seen  1 mark for correct answer  1 mark for y = 0  1 mark for x² - ½ x²  1 mark for ½ x²  1 mark for correct answer  1 mark for correct explanation | 10 |