**MATHS PAPER 1**

**MARKING SCHEME**

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| 1. | 1 5   1. 2   3  1  1  6 | M1  M1  A1  3 |
| 2 |  | M1  M1  A1  3 |
| 3. | y =  M1 =  3(0) = 2x – 6  2x = 6  X = 3  T-intercept  3y = 0 – 6  y = -2  B (0, -2)  = = | B1  B1  B1  3 marks |
| 4. | 0.3309 +  0.3309 + 3  0.3309 - 595.20  =  =  =  = =  = | M1 (correct square and cube root)  M1 (correct reciprocal)  M1 (correct square & reciprocal)  A1  4 marks |
| 5. | x    Sum = 0 + 5  = 5 | B 1  M1  A1  3 marks |
| 6. | 20 km  M K  10.00 am 9.30 am  Let Kilonzo’s speed be x km/hr  Makau’s speed will – ¾ x  In ½ hr Kilonzo covered ½ s km  Remaining distance = (20 – 0.5x) km  Time taken to meet 11:30 – 10:00 = 1 ½ hrs  R.s = ¾ x + x = 7x/4  20 – 0.5x =  160 – 4x = 21x  160 = 25x  X = 6.4 km/hr  Kilonzo’s speed = 6.4 km/hr  Makau’s speed = ¾ x 6.4 = 4.8 km/hr | M1  A1  A1 |
| 7. | l.s.f. =  Let the area of ΔXYC be X.  Area of triangle ACB = 9x  9x – x = 36  8x = 36  x = 4.5 | M1  M1  A1 3 marks |
| 8. | =  2(0.48) – 0.30  0.96 – 0.30  = 0.66 | M1  A1  2 marks |
| 9. | P  10 cm  r  A x O B  102 + (r – 4)2 = r2  100 + r2‑ - 8r + 16 = r2  116 = 8r  r = 14.5 | M1  M1  A1  3 marks |
| 10. | -1 = (-1)2 + 3(-1) + c  -1 = 1 – 3 + c  -1 + 2 = c  y = x2 + 3x + 1 | M1  M1  A1  3 marks |
| 11 | =  = | M1  M1  A1  3 marks |
| 12. | Mid ordinates   |  |  |  |  | | --- | --- | --- | --- | | x | 0.5 | 1.5 | 2.5 | | y | 1.125 | 2.125 | 4.125 |   A = 1 [1.125 + 2.125 + 4.125]  = 7.375 square units | B1  M1  A1  3 marks |
| 13. | A B  750  5  5    AB =  = 19.32  AB = 19 cm  Area = x 2  = 180.5 cm2 | M1  A1  A1 |
| 14. | D  x  480  20  C B 10m A  1.5  y  Tan 20 = tan 40 =  x = y tan 20 x = (y -10) tan 40  y tan 20 = 1 y tan 40 – 10 tan 40  y = =  y = 17.66  x = 17.66 tan 20 = 6,428  height = 6.428 + 1.5 = 7.928 m | M1  M1  A1  B1 4 marks |
| 15 | Actual (4 – 5)2 = 81  Incorrect (4)2 + (-5)2 = 41  Error =  = 0.49% | B1  M1  A1  3 marks |
| 16. | Length of tangents = 2  = 19.9 cm  = 33.560  Total length = 19.9 + 46.024 + 7.032  = 72.96 cm | M1  M1  M1  A1  4 marks |

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| 17. | (a)  R = r + 7  R = 1.2r  R + 7 = 1.1 r  7 = 1.1 r – r  7 = 0.1 r  R = 70m | M1  M1  M1  A1  4 marks |
|  | (b) Inner radius = 70m  2 x 70 = 400m    Outer radius r = 77m  2  Total number of posts = 88 | M1  A1  M1  A1  B1 5 |
|  | (c) total cost  88 x 105 = sh 9240 | B 1 |

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| 18. | O  Sin 360 =  36  H = = 20.4156194 cm ✓(1)  X 12 B  But  24h = 240 + 12h  12h = 240  h = 20 ✓  (1)  H = 40 ✓  V  VB =  =  20  40 = 44.90876 ✓ (1)  20 Hence ✓ (1)  O B l =    l = 22.454 cm ✓ (1) | 5 marks |
|  | (b) Tan 36 =  77  h h =  12  24  A =  1  =  =990.995cm2 ✓ (1)  Area of pentagonal base = 5 x 198.198  Volume of the whole pentagonal cone  = 118,919.3979 cm3 ✓ (1)  L.sf = 1: 2  V.sf = 1 : 8  8 118,919.3979  1 ?  = 14,864.92474 ✓ (1)  Volume of trustum  = 118,919.3979 – 14,864.92474  = 104,054.4743 cm3 ✓ (1) | 5 marks |
| 19. | A + B + C + D (1 day) 4200 bags  A + B = ; 1400 (1 day) M1  C + D = ; 2800 (1 day)  A = 3/2 B C = 1 4/5 D = 9/5D A1  (a) 3/2b + B = 1400 B1  3B + 2B = 2800  5B = 2800  B = 560 bags  A = 3/2 x 560 = 840 bags B1  9/5 D + D = 2800  9D + 5D = 14000  14D = 14000  D = B1  C = 9/5 D = 9/5 x 1000 = 1,800 bags B1  (b) A + B + C + D  (840 + 560 + 1800 +1000)  5 (4200) = 21,000 5 days B1  A and B 5 (840 + 560)  5 x 1400 = 7000 B1  Remaining 42000 – 28000  = 14,000 bags B1  B takes B1 | 6 marks  4 marks |
| 20. | (a) Eunice  Sharon oranges  B1  B1  B1  (b) M1  45x – 45x + 33.75 = 2x (x – 0.75)  33.75 = 2x2 – 1.5x  2x2 – 1.5x – 33.75 = 0  8x2 – 6x – 135 = 0 M1  x =  x = x = -3.75  x = 4.5 A1  x = sh 4.50  Eunice sh 4.50 per orange B1  Sharon 4.50 – 75 = sh 3.75 B1  (c) Eunice M1  Sharon = 14 oranges  Total number = 12 + 14 = 26 oranges A1 | 10 marks |

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| 21 | 1. ½ x 54 x V = 810 M1   V =  V = 30 m/sec A1   1. a =   5/3t = 30  t = = 18 secs  Decc u = 30 m/s, V = om/s  t = 54 – 18 = 36 secs  a =  (b) (i) bus 60 km/h car 100 km/hr  Time 1/0 hr  Distance = ½ x 60 = 30 km  t = = = hrs  time 11.15  45  12.00  12.00 noon  (ii) d = ¾ x 100 = 75 km  Remaining 425 km  Bus = 7 ½ hrs  Car = 4 ¼ hrs  2 5/6 hrs  Or 2 hours 50 minutes | M1  A1  M1  M1  A1  M1  M1  A1  10 marks |
| 22  (a) | V = at2 + bt   1. = a + b   At t = 45 also at – t = 0 s – 0  s = 0  0 =    182.25a + 60.75 b = 0  A = 2 – b  182.25 (2 – b) + 60.75b = 0  364.5 – 182.25 b + 60.75 b = 0  364.5 = 121.5b  b = 3  A = 2-3 = -1 | M1  M1  M1  A1 (for accurate values of a & b) |
| (b) | 1. S =   V = -t2 + 3t  0 = -t2 + 3t  t2 = 3t  t = 3 secs | M1  A1 |
|  | (ii)  =  2 2/3 | M1  A1 |

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| 23 | |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | x | -4 | -3 | -2 | -1 | 0 | 1 | 2 | -1.5 | 0.5 | | y | -60 | -28 | 4 | 3 | -4 | -5 | 12 | 5 | -6 |      1. y = 2x3 + 3x2 – 6x – 4   -0 = 2x3 + 3x2 – 4x – 2  Y = -2x – 2 B1  Solutions x = -2.1, -0.5, 1.1 B1  x3 +  2x2  + 3x2 – 6x – 4 = y B1  2x3 + 3x – 6x – 4 = 0  x = -2.2, -0.6, 1.4 B1 | B1 B1 B1 |
| 24. | B C  D D  **b**  E  O A  **a**   1. (i) **a** + **b**   (ii) h (**a** + **b**)  (iii) = **b** – ½ **a**  (iv) = k (**b** – ½ **a**)   1. = **a** + k (**b** – ½ **a**)   **a** + k**b** – ½ k**a** = h**a** + h**b**  (1 – ½ k) = h  K – h  1 – ½ h = h  1 = 3/2h  h = 2/3 k = 2/3   1. = 2/3   AE : ED  2 : 1  OE : OC  OE = 2/3  = 2 :1 | B1  B1  B1  B1  B1  M1  A1, A1 for h & k  B1  B1 |