**MATHS PAPER 1**

**MARKING SCHEME**

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| 1. |  1 51. 2

 3 1 1 6 | M1M1A13 |
| 2 |  | M1M1A13 |
| 3. | y = M1 =  3(0) = 2x – 6 2x = 6 X = 3 T-intercept3y = 0 – 6y = -2B (0, -2)= =  | B1B1B13 marks |
| 4. | 0.3309 + 0.3309 + 3 0.3309 - 595.20= == = = =  | M1 (correct square and cube root)M1 (correct reciprocal)M1 (correct square & reciprocal)A14 marks |
| 5. | x  Sum = 0 + 5= 5 | B 1M1A13 marks |
| 6. |  20 kmM K 10.00 am 9.30 amLet Kilonzo’s speed be x km/hr Makau’s speed will – ¾ xIn ½ hr Kilonzo covered ½ s kmRemaining distance = (20 – 0.5x) kmTime taken to meet 11:30 – 10:00 = 1 ½ hrsR.s = ¾ x + x = 7x/420 – 0.5x = 160 – 4x = 21x160 = 25xX = 6.4 km/hrKilonzo’s speed = 6.4 km/hrMakau’s speed = ¾ x 6.4 = 4.8 km/hr | M1A1A1 |
| 7. | l.s.f. = Let the area of ΔXYC be X. Area of triangle ACB = 9x9x – x = 368x = 36x = 4.5 | M1M1A1 3 marks |
| 8. |  = 2(0.48) – 0.300.96 – 0.30= 0.66 | M1A12 marks |
| 9. |  P 10 cm r A x O B102 + (r – 4)2 = r2100 + r2‑ - 8r + 16 = r2116 = 8rr = 14.5 | M1M1A13 marks |
| 10. | -1 = (-1)2 + 3(-1) + c-1 = 1 – 3 + c-1 + 2 = c y = x2 + 3x + 1 | M1M1A13 marks |
| 11 | = =  | M1M1A13 marks |
| 12. | Mid ordinates

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| 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 | B1M1A13 marks |
| 13. |  A B 750 5 5 AB =  = 19.32AB = 19 cmArea = x 2 = 180.5 cm2 | M1A1A1 |
| 14. |  D x 480  20 C B 10m A 1.5 yTan 20 = tan 40 = x = y tan 20 x = (y -10) tan 40y tan 20 = 1 y tan 40 – 10 tan 40y = = y = 17.66x = 17.66 tan 20 = 6,428height = 6.428 + 1.5 = 7.928 m | M1M1A1B1 4 marks |
| 15 | Actual (4 – 5)2 = 81Incorrect (4)2 + (-5)2 = 41Error = = 0.49% | B1M1A13 marks |
| 16. | Length of tangents = 2  = 19.9 cm = 33.560Total length = 19.9 + 46.024 + 7.032 = 72.96 cm | M1M1M1A14 marks |

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| 17.  | (a)R = r + 7R = 1.2rR + 7 = 1.1 r7 = 1.1 r – r7 = 0.1 rR = 70m | M1M1M1A14 marks |
|  | (b) Inner radius = 70m 2 x 70 = 400m  Outer radius r = 77m 2 Total number of posts = 88 | M1A1M1A1B1 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 BBut 24h = 240 + 12h12h = 240h = 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 24A =  1 =  =990.995cm2 ✓ (1) Area of pentagonal base = 5 x 198.198Volume of the whole pentagonal cone = 118,919.3979 cm3 ✓ (1)L.sf = 1: 2V.sf = 1 : 88 118,919.39791 ?= 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 bagsA + B = ; 1400 (1 day) M1C + 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 marks4 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 A11. a =

5/3t = 30t = = 18 secsDecc u = 30 m/s, V = om/st = 54 – 18 = 36 secsa = (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 12.0012.00 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 | M1A1M1M1A1M1M1A1 10 marks |
| 22(a) |  V = at2 + bt1. = a + b

At t = 45 also at – t = 0 s – 0 s = 0 0 =   182.25a + 60.75 b = 0A = 2 – b182.25 (2 – b) + 60.75b = 0364.5 – 182.25 b + 60.75 b = 0364.5 = 121.5b b = 3A = 2-3 = -1 | M1M1M1A1 (for accurate values of a & b) |
| (b) | 1. S =

V = -t2 + 3t0 = -t2 + 3tt2 = 3tt = 3 secs | M1A1 |
|  | (ii)  =  2 2/3 | M1 A1 |

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| 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 – 2Y = -2x – 2 B1Solutions x = -2.1, -0.5, 1.1 B1x3 + 2x2  + 3x2 – 6x – 4 = y B12x3 + 3x – 6x – 4 = 0x = -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) = hK – h1 – ½ h = h1 = 3/2hh = 2/3 k = 2/31. = 2/3

AE : ED2 : 1OE : OCOE = 2/3 = 2 :1 | B1B1B1B1B1M1A1, A1 for h & kB1B1 |