**MUMIAS WEST JET**

**TERM 1 – JUNE 2022**

**FORM 4 - MATHEMATICS PAPER 1**

**MARKING SCHEME**

|  |  |  |  |
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| NO. | WORKING | MARKS | COMMENTS |
| 1 | 5 x6 +(-76) 4 +27  -15x (-4)  = 30 + (-19) + 9  -5 x-4  = = 1 | M1  M1  A1  **3** | For numerator  For denominator |
| 2 | 2268= 22 x 34 x 7  X = 22 x34 x 72 = 7  22 x34 x7 | B1  M1 A1  **3** |  |
| 3 | Amt in Ksh = 5000 x 114.2  = 571000  Remainder = 571000-276100  = 303900  Amt in Euros = 303900  101.30  = 3000 Euros | M1  M1  A1  **3** |  |
| 4 | 2x2 + 3x -2 = (2x -1)( x+ 2)  X3-4x x( x2 -4)  *= (2x -1)( x+ 2)*  *x( x -2)( x + 2)*  = 2x - 1  X( x- 2) | M1  M1  A1  **3** | Factorizing numerator  Factorizing denominator  Simplified expression |
| 5 | 179 - 3 = 176  234 – 3 = 231  176 = 24 x 11  234 = 3 x 7 x 11  GCD = 11  Number of pieces = +  = 16 + 21  = 37 | B1  M1  A1  **3** | For GCD |
| 6 | 1. - n =   n  = 1 -  =  n = 5    n =5 | M1  M1  A1  **3** |  |
| 7 | -  3(4-y) – 4(9-2y) =6  12-3y -36 +8y = 6  5y =30  Y=6 | M1  M1  A1 **3** | For removal of denom.   * Opening of brackets   c.a.o. |
| 8 |  | B1  B1  B1  B1 **4** | For locus (i)  For locus (ii)  For locus (iii)  For the region |
| 9 | =  = 0.3077  = 3.077  = 0.5  = 1.5385  = 1.5 | B1  M1  A1 **3** | For reciprocal with evidence of working |
| 10 | External area = 20.1 × 2.2 = 44.22  Internal area = 19.1 × 1.2 = 22.92  Area of path = 44.22 – 22.92  = 21.3 | M1  A1  **2** | 0.5  0.5 |
| 11 | +60 = 180  2X = 120˚  X = 60˚  Exterior =60  No. of sides =  = 6 sides | M1  M1  A1 **3** |  |
| 12 |  | B1  B1  B1  **3** | Sides  Broken lines  Shape of solid |
| 13 | Total = 42×24 = 1008  Total with abs = 1008-65  = 943  Average = =41 | M1  M1 A1  **3** |  |
| 14 | = +  Gradient =  =  2(-2) = -3(x+3)  2 – 4 = -3x – 9  3x + 2 = -5 | B1  M1  A1 **3** |  |
| 15 | B = +  = +  = +  = | B1  M1 M1  A1  **4** | For  - Squaring A  - Addition |
| 16 | 1. AC = 7.2km 2. Bearing 273˚ | B1  B1  B1  B1  **4** | For B  For C |
| 17a    b      c    d | X = 100-78  = 22  Modal class 35-44   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  | x |  |  |  |  | | 15-24 | 19.5 | 6 | 6 | -40 | -240 | | 25-34 | 29.5 | 14 | 20 | -30 | -420 | | 35-44 | 39.5 | 24 | 44 | -20 | -480 | | 45-54 | 49.5 | 14 | 58 | -10 | -140 | | 55-64 | 59.5 | 22 | 80 | 0 | 0 | | 65-74 | 69.5 | 10 | 90 | 10 | 100 | | 75-84 | 79.5 | 6 | 96 | 20 | 120 | | 85-94 | 89.5 | 4 | 100 | 30 | 120 | |  |  | 100 |  |  | -940 |   Median = 44.5 + × 10  = 44.5 + × 10  = 44.5 + 4.29  = 48.79  Mean = + A  = 59.5 -  = 50.1 | M1  A1  B1  B1  B1  B1  M1  A1  M1  A1  **10** | For vcf  For  For = -940 |

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| 17 | a)  x = 5  x + 12 10  10x = 5x + 60  5x = 60  X = 12  L = 242 + 102 = 26  1/26 = 5/10  L = 13  Slant height 26 – 13  = 13  b) Curved area of the frustum  S.A = RL - rl  =  (260 – 65)  = 612.6  c) Volume of the frustrum  1/3  (R2H – r2h)  = 1/3  (2400 – 300)  = 1/3  (2100)  = 2200 cm2 | M1  M1  A1  M1  M1  A1  M1M1M1  A1 | When 13 is seen  Both reas correct  ✓ - |
|  | Total marks | 10 |  |
| 18 | 1. 1 1/2 x 80   = 120km   1. 120 – 50   = 40   1. Time taken     = 3hrs  8.300 + 3  11.30A.m   1. 3 x 120   = 360km   1. 600 – 360 = 240km | M1  A1  M1  A1  M1  A1  B1  M1  A1  B1 | For 11.30am  For 240 |
|  | Total marks | 10 |  |
| 19 | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Class | Tally | Frequency | Mid point | Fx | Cf | | 145 – 149  150 – 154  155 – 159  160 – 164  165 – 169  170 – 174  175 - 179 | 11  1  1  11  11  111 | 2  1  11  5  7  7  3 | 147  152  157  162  167  172  177 | 294  152  1727  810  1169  1204  531 | 2  3  14  19  26  33  36 | |  |  |  |  | Fx2  5887 |  |   b) i) 5887  36  = 163.53  ii) 159.5+5  = 159.5 + 1. 8182  = 161 . 32   1. Graph   G:\Drive\maths p1 msch 3.jpeg | B1  B1  B1  B1  A1  M1  A1  B1  B1 | ✓ classes  ✓ frequencies  (all Tallies)  ✓Fx (frequency)  X midpoints  ✓ Cumulative  Frequency (c.f)  ✓Plotting  ✓ curve  (No hanging curve. Not drawn by use of free hand) |
|  | Total marks | 10 |  |

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| 20 | | . a) i) 16200  Y  ii) 16 200 or 16 200 – 60  y + 3 y  b) i) 16 200 – 16 200 = 60  y y + 3  60y2 + 180y – 48 600 = 0  Y2 + 3y – 810 = 0  (y + 30) ( y – 27) = 0  = 27 or -30  = y = 27  ii) 16200 = Ksh 540  30  iii) 15 x 16 200  100 27  = Ksh 90 | | B1  B1  M1  M1  M1  A1  M1A1  M1  A1 | | | Simplifying and removing brackets  Factors equated to zero  Evidence of discrimation of -30 seen |
| 21 | | G:\Drive\maths p1 msch 4.jpeg  c) | | B1  B1  B1  B1  B1  B1  B1  M1A1 | | | 600 ✓ constructed locating point A  Dropping a  Length the  8.2 + 0.1  For a line at an angle to BC  For joining C to the last point  For locating point D  ( following through) |
|  | | Total marks | | 10 | | |  |
|  | |  | |  | | |  |
| 22 | | 1. I) BN = BA + AN   = -a + 5/6 b  = 5/6b – a  ii) CM = -b + 2/5a  = b + r ( 2/5a - b)   1. AX = b + rCM   = b – rb + 2/5ra  = ( 1 – r) b + 2/5ar  Ax = a + k ( 5/6b – a)  ( 1 – k)a + 5/6kb  ii) ( 1 – r) b + 2/5ar = ( 1 -k) a + 5/6kb  5/6K = 1 – r – ( i)  2/5r = 1 – k -- (11)  K = 6/5 – 6/5r  2/5 = 1- ( 6/5 – 6/5r) = 1 – 6/5 + 6/5r  -4r = -1 = 7 r = ¼  5/6K = ¾  K = 9/10 | | B1  B1  M1  M1  M1  M1  Al | | | Equating two values of AX.  Two equations extracted |
|  | |  | | 10marks | | |  |
| 23 | | | K:\scan 2017\Scan 2017 2.jpg  (b) A1(4,-4) B1(7,-3) C1(2,-1)  (c) A11(4,4) B11(3,7) C11(1,2)  (d) A111(4,-4) B111(3,-7) C111(1,-2) | | B1  B1  B1  B1  B1  B1  B1  B1  B1  B1 | For plotting  For ∆ABC  For ∆A1B1C1  For construction or otherwise  For ∆A11B11C11  For construction or otherwise  For ∆A111B111C111 | |
|  |  | | |  | | |  |
| 24a)  b)  c)  d) | S = t (t2 – t – 2t + 2)  = t3 – 3t2 + 2t  ds = 3t2 – 6 (2) + 2  dt  V = 3 ( 4) - 6 ( 2) + 2  V = 2m/s  dv = 0  dt  dv = 6t – 6  dt  6t – 6 = 0  t = 1  = 3( 1)2 – 6(1) + 2  = -1m/s  3t2 – 6t + 2 = 0  T = 6 + (-6)2 – 4 ( 3) ( 2)  T = 6 + 3.464  T = 1.577 or 0.4227  a = 6 ( 3) – 6 = 12m/s2 | | |  | | | B1  M`  A1  M1  M1  A1  M1  A1  B1 |
|  | Total marks | | | 10 | | |  |

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