**MATHEMATICS PAPER 2**

**MARKING SCHEME**

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| 1. |   5 X 49 X 39 X ~~1000~~ X 10000 X 1001000 10000 10 ~~325~~ ~~6~~ 5 2 = $\sqrt{490 }$ = 7 10 | B1M1M1A1 |
| 2. | (3*x*2)° ( $\frac{1}{3X }$)6 + (3x2)1 ($\frac{1}{3X })$5 + (3x2)2 ($\frac{1}{3X }$)4 + (3x2)3 $(\frac{1}{3X }$)3 + (3x2)4 ($\frac{1}{3X })$2 + (3x2)5 ($\frac{1}{3X }$)1 + (3x2)6 ($\frac{1}{3X }$)° 9x4 x $\frac{1}{81x }$ x 15 = $\frac{5}{3}$  | B1M1A1 |
| 3. |   2 $\sqrt{6}$ - $\sqrt{3}$ = 2$\sqrt{6 }$ - 2 $\sqrt{3 }$ 2$\sqrt{6 }$ $\sqrt{3 }$ $\sqrt{6}$ $\sqrt{3}$ 3 5 $\sqrt{7}$ + $\sqrt{5}$ = 5$\sqrt{7}$ + 5$\sqrt{5}$ $\sqrt{7}$ - $\sqrt{5}$ $\sqrt{7}$ + $\sqrt{5}$ 2 2 $\sqrt{6}$ - 2$\sqrt{3 }$ - 5 $\sqrt{7}$ + 5$\sqrt{5}$  3 2 = 4$\sqrt{6 }$ - 4$\sqrt{3}$ - 15 $\sqrt{7}$ - 15 $\sqrt{5}$ 6 | M1M1A1 |
| 4. |   Tan 45 - cos 30* - Sin 30 + (- cos 60)
1. - $\sqrt{3}$

2 = 2 $\sqrt{3}$ - 2* $\frac{1}{4}$
 | B1M1A1 |
| 5. | (a – b)2 = ($ \sqrt{b^{2}+c^{2}} $)2 a2 – 2ab + b2 = b2 + c2 c2 = a2 - 2ab c = + $\sqrt{a^{2}+2ab^{}}$ | M1M1A1 |
| 6. | AB = K 4 1 2 = 12 + K 2K + 16 3 2 3 4 9 14  14(12 + K) - 9 (2K + 16) = 4 A’ B’ C’  5 0 2 3 3 = 10 15 15 0 1 0 2 4 0 2 4  | M1M1A1 |
| 7.a.b.8. |  x2 + y2 + 2x - 3y = 13x2 + 2x + 12 + y2 - 3y + ( $\frac{3}{2}$ )2 = 13 + 1 + $\frac{9}{4}$ Centre = ( -1 , $\frac{3}{2}$) $\sqrt{\left(-1\right) 2+( \frac{3}{2}}$ )2 = 1.8028  ( -1, $\frac{3}{2}$ ) (3, 2)  (-1 - 3)2 + ( $\frac{3}{2}$ - 2)2 = 16 + $\frac{1}{4}$ = 4.031 x 2  = 8.062 x + y + 2 = 9y = ½ (x + z)x = ½ z½ z + ¼ z + ½ z + z = 9z = 4x = 2, y = 3The number is 234 | M1A1M1A1M1M1A1 |
| 9. |  Y = β 12 = β β = 12 x 2n xn 3 = β β = 3 x 4n 4n  12 x 2n = 3 x 4n 4 x 2n = 4n n = 2 β = 12 x 4 = 48 | M1M1 A1A1 |
| 10.11. |  x(9 – x2) = 0 x = 0, -3 or 3 1 -3 3 4 0 (9x – x3) dx = $\frac{9}{2}$ x2 - $\frac{x}{4}$  -3 = -20 $\frac{1}{4}$ 4 3$ \frac{9}{2}$ x2 - $\frac{x}{4}$  0 = 20 $\frac{1}{4}$ Area = 20 $\frac{1}{4}$ + 20$ \frac{1}{4}$  = 40 $\frac{1}{2}$ 182 + v2 = (12 + r)2180 = 24rR = 7.5cm | B1M1M1A1M1M1A1 |
| 12. |   VX = 402 - 112 = 38.46 V 38.46  O 15 X Cos θ = $\frac{15}{38.46}$ = 0.3900 θ = 67.04 | B1M1A1 |
| 13. |  2 3 - 3 2 = 0 -2 -4 8 3 -3 15 $\sqrt{8^{2}+15^{2}}$  = 17 units | M1M1A1 |
| 14. |   + 2$ \sqrt{25x^{2}}$ x $\sqrt{9}$  = + 2 (10x) (3) = + 45 x | M1A1 |
| 15. |  5.42 = 8.82 + 9.22 - 2(8.8) (9.2) cos A Should use cosine rule to find any angle A = 34.83° 5.4 = 2r Sin 34.84  r = 4.72 = 5cm | B1M1A1 |
| 16. |  1. < ABC = 66°
2. < BCA = 33°
 | A1A1 |
|  | **SECTION II** |  |
| 17. | Tax p.a = 28, 800 720 + 7,920 Sh 37,440 4512 x 2 = 9024 4512 x 3 = 13536 4*x* = 14880 *x* = 3720 (4512) x 2 + 3720 = K£ 12744 p.a115 x (*x*) - 366 = 12744100  *x* = K£ 11400 basic salary 11400 x 20 = Sh 19,000 p.m. 12 Net salary per month 19000 – (1200 + 2400 + 1500) = sh.13900 | M1A1M1M1A1M1M1M1M1A1 |

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| 18.19.a.b.i.ii. |  < 60 ABC Bisect AB Shading Arc CQ Shading Bisecting <C Shading 0.5Area = 36 x 22 x ~~3.5~~ x 3.5 360 7  = 3.85cm2 45 x 2 x 22 x 0.7 = 0.55 m 360 7   B Cos 30 = AB 30° 0.7 0.7m AB = 0.7 cos θ  AB = 0.6062M A 120 + 110 = 230° 230 x 22 x (0.7 cos 60)2 360 7 = 0.246M2 | B1B1B1B1B1B1B1B1M1A1M1M1A1M1M1A1B1M1M1A1 |
| 20. | 1. both = x ; HBP = 15 – x : cholesterol = 25 – x

 15 – x + 25 – x + x = 30 x = 10 = 15 – 10 = 5  P(HBP) = $\frac{5}{40}$ = $\frac{1}{8}$ 1. P(CHOL ) = 25 – 10 = $\frac{15}{40}$ = $ \frac{3}{8}$
2. P(BOTH) = $\frac{ 10}{40}$ = $ \frac{1}{4}$
3. P(EITHER HBP or CHOL) = $\frac{1}{8}$ + $\frac{3}{8}$ + $\frac{4}{8}$ = $\frac{1}{2}$
 | B1M1M1A1M1A1M1A1M1A1 |
| 21.a.b. c.d. |  3 4 4 - 2x1. 2x

 3 2x 2x - 2x - 1 3 2x + 1 4x - 2x = 1 2x = 5 x = $\frac{5}{2}$  (32 )5/7 = 35 81 = 1 243 3 729 ( 1 - $\frac{1}{3})$10  1 - $\frac{1}{3}$  729 (0.9999) = 1093.5 $\frac{2}{3}$For the AP a = 9 d = 8 n = 20 $\frac{20}{2}$ 18 - 8 x 19 10 ( - 134) = - 1340 | M1A1M1A1M1M1A1B1M1A1 |
| 22.b.23.i.ii.iii.iv.v.24.a.b.c. | Log (y – x) = blox + log A

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| X | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 |
| Y | 7.54 | 9.33 | 11.00 | 12.59 | 14.12 | 19.90 | 27.23 |
| y-x | 6.54 | 7.83 | 9.00 | 10.09 | 11.12 | 16.40 | 23.23 |
| Log (y-x) | 0.82 | 0.89 | 0.95 | 1.00 | 1.05 | 1.21 | 1.37 |
| Log (x) | 0 | 0.18 | 0.30 | 0.40 | 0.48 | 0.54 | 0.60 |

 Graph P1 Log a = 0.8 A = 6.310* 1. - 0.8

 0.48 – 0 = 0.5208y = *x* + 6.310*x* 0.5208

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| marks | f | c.f |
| 0 - 9 | 6 | 6 |
| 10 – 19 | 8 | 14 |
| 20 – 29 | 12 | 26 |
| 30 – 39 | 9 | 35 |
| 40 – 49  | 7 | 42 |
| 50 – 59  | 5 | 47 |
| 60 - 69 | 3 | 50 |

CurveMedian ½ x 50 = 25 28Q3; ¾ x 50 = 37.5 42 Q; ¼ x 50 = 12.5 17 42 – 17 = 12.5 220 x 100 = 40%5035 x 50 = 17.5 22100 65 x 50 = 32.5 36100 36 - 22 = 14 5x + 8y > 800 x + y ≤ 250 x ≤ 200 x ≤ 50 y ≤ 2x  Graph Each correct drawing + correct shading for each 85 seats y = 165 seats  | B1B1B1L1S1M1A1A1B1B1B2B1B1A1M1A1M1A1B1B1B1B1B4B1B1 |