**121/2**

**MATHEMATICS PAPER 2MARKING SCHEME**

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| 1. | No. Log−0.7214 2.858220.37 0.3090− 1.1672 x 69.8 1.72241.8439− 3.8785 7.560 x 10-3 | M1M1A1 | ✓ Logs ✓ x, - |
| 2. | Co-ordinates of mid-point M:OM = (OP + OQ)˜˜= = = Hence M Gradient of PQ = = Equation of bisector of PQ at = 6y – 7.5 = 6x -6y = 6x +  | M1M1A1 | ✓ Co-ordinate M✓ Equating to ||⊥ gradient✓eqn |
| 3. | A.S.F = , L.S.F = = V.S.F = =  = , v = 68.175cm3 | M1A1 | ✓ VSF✓Vol accept to 4 sf |
| 4. |  x 800 = 696 (selling point)B.P x = 696, B.P = KSh. 580 | B1B1 | ✓ S.P✓ B.P |
| 5. | C:\Users\Nzambia\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\17.jpg | L1L1L1 B1 | For ✓ y < x + 4 plotting & shading For ✓ Plotting & shading y ≤ 6 – xFor ✓ plotting y ≥ 2For ✓ identification of R |
| 6. |  - x 100 x 100= x 100 = 33% increase | M1M1A1 | ✓✓FactorisingOv |

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| 7. | Log (5x + 75) – Log (2x – 9) = Log32Log = Log32 = 95x + 75 = 9(2x – 9)156 = 13xx = 12 | M1M1A1 | ✓eqn in logs✓ Logs removed (all)✓ Value of x |
| 8. | 2a = 2(3i – 2j + 3k˜˜˜˜˜= 6i – 4j + 6k3b = 3(2i – 4j – 3k)˜˜˜= 6i – 12i – 9k˜˜˜2a – 3b = 8j + 15k˜˜˜˜|2a – 3b) = ˜˜= 17 | M1M1A1 | ✓ 2a and 2b values✓ calculation of magnitude✓ Ans |
| 9. | A3 = A3b + A3x = bxx(b – A3) = A3bx = Substituting for A = 2 and b = 6, = = -24 | M1M1A1 | ✓ Removal of ✓ Simplification✓Eqn |
| 10. | (a) 6(XC) = 5 x 4.8 XC = = 4cm(b) 8 x (8 + 4 + 6) = BT2 BT = = 12cm | M1A1A1 | ✓Eqn✓ XC✓Eqn✓ BT |
| 11. | Adding: = Multiply by conjugate:-•= = 6 +102 +  |  |  |
| 12. | (a) y = kx + cx245 = 20k + 400c60 = 24k + 576c270 = 120k + 2400c300 = 120k + 2880cc = = 45 = 20k + , k = 1hence y = x + (b) 75 = x +  + 16x – 1200 = 0x = x = -43.56 or 27.56 | M1M1A1 | ✓ Substitution✓ c, k✓eqn |
| 13. |  = a6 + 6a5(-x)1 + 15a4(-x)2 + 20a3)-x)3a6 – 6a5x + 15a4x2 – 20a3x3(a – x)6 = 2.996 = (3-0.01)6a = 3, x = 0.01hence 36 – 6 x 35x (0.01) + 15 x 34 (0.01)2 – 20 x 33 x (0.01)3729 – 14.58 + 0.1215 – 0.00054= 714.54096= 714.541 | M1A1 | ✓ Expansion✓ Simplification in a, xCAO |
| 14. | Third pieceMax length: 3.05 – (1.25 + 0.935)= 0.865mMin length: 2.95 (1.35 + 0.945)= 0.655mHence 0.655 to 0.865m | B1B1B1  | ✓ Expression for max length✓ Exp. For min length✓ Identify of upper & lower limit. (Accept given as range |
| 15. | 1kg of Tamu mixed with x kg of Chungu(70 x 1) + (64 x x) = 68 x (1 + x)70 + 64x = 68 + 68xx = Tamu: Chungu = 1: x = 1:= 2:1 | M1A1 | Alternative Formula✓eqn to find x Tamu Chungu 70 64 68 4 2 |
| 16. |  + 8x + + + = 1 + + (x + 4)2 + (y – 1)2 = 18Centre of circle (-4, 1)Radius of circle = or 4.243 | M1 M1A1 | ✓eqn✓Eqn of circle expressed ✓ Centre & Radius |
| 17. | C:\Users\Nzambia\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\18.jpg(b) (i) = x + x = + = =  (ii) x x + x  = + =  =  | B2M1A1M1 | ✓ All (B1 ✓ one arm |
| 18. | (a) Det = 32 – 35= - 3P-1 = -(b) (i) 8b + 14m = 4760010b + 16m = 57400 = or  = (ii) =  =  = Bag of beans cost Sh. 3500Bag of maie cost Sh. 1400(c) x 3500 = 40258 x 4025 = 3240047600 – 32400 = 15400∴1400m = 15400m = 11 bagsRatio 8:11 | B1B1M1A1M1M1A1B1B1B1 | ✓ Accept Both  |
| 19.20. | (a) = 38000 + 14000 + 8500 + 3300 = 62800 K£ 37680 p.a.(b) 1st K£ 600 🡪 6000 x 2 = 12000Next £6000 🡪6000 x 3 = 18000Next £6000 🡪 6000 x4 = 24000Next £6000 🡪 6000 x 5 = 30000Next £6000 🡪 6000 x 6 = 36000Next £6000 🡪 6000 x 7 = 42000Rem. £ 1680 🡪 1680 x 8 = 13440Tax due p.a. = Sh. 175440Less relief Sh. 18000Tax paid = Sh. 157440(c) (i) Tax paid per month = = 13,120Total deductions = 13120 + 320 + 1000 + 2000 + 500= 23940(ii) Net salary = 62800 - 23900 38,9001. =

 =  =  -1 = 4 – 2xx = 2.51. Common ratio =

= = = 1. a =

= = 729S4 = 729 = 729 = 729 = 729 x x = 1080 | M1A1M1M1M1A1M1A1M1 | ✓ Taxable income in Sh/m (can be implied in accuracy mark)✓Values in just 4 slabs✓ Subtracting relief✓ Addition✓ Ans  |
| 21. | (a) (i) Fraction filled in 1 hr by PtQ = + =  Time taken to fill tank = = 1 hrs (ii) Fraction filled in 1 hr by P, Q & r = - =  Time taken to fill = = 18 hours(b) (i) Fraction filled by 9.00 a.m P 🡪 x 1 hr =  Q 🡪 x hrs =  Both P and Q 🡪 +  =  (ii) Fraction to be filled =  Time taken = x 18 = 12 hrs Time taken for taken to fill up = 0900 1230 2130 hrs or 9.30 p.m  | M1A1M1A1M1M1A1M1A1 |  |

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| 22. | (a) (i) ON = OP + PN = P + PQ= p + q - p˜˜˜ = p + q ˜˜(ii) PM = PO + OM=-p + q(b) (i) OX = hON  = h = hp + hq˜˜ OX = OP + PX = P + kPM = P + k (-p + ) = p – kP + q = (1 – k)p + kq˜hp + hq = (1 – k)p + kq˜ = 1 – k………. (i)h = k …………...(ii)From (ii) h = kSubt in (i)  x k = 1 – kk = h = (ii) PX : XM = : = 5 : 4 | M1A1M1A1B1B1M1M1 | Equating eqnsFor extracting coefficients |
| 23. | (a) ∠QRS = 900 (Subst. by the remainder)∠ PRS = 90 – 70 = 200(b) ∠POQ = 2 x 700 = 1400∠at centre is twice ∠ at circumference(c) ∠RQP = = 550( Base angles of a Δ)∠RQP and ∠PSE are supplementary (cyclic  quadrilateral)∴∠PSR = 180 – 55 = 1250∠ QSR = 125 – 70= 550(d)∠PSQ = ∠PRQ = 700 (Subst. by same arc)∠QSP = ∠SPO = 700 (base angles of isoscles Δ)Reflex ∠POS = 360 – 40= 3200 |  | B1B1B1B1B1 |

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| 24. |

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| x | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 |
| y | -5 | 15 | 19 | 13 | 3 | -5 | -5 | 9 |

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|  | (c) (i) x = -4.85 x = -0.7 x = 1.5 (ii) x3 + 4x2 – 5x – 5 = -4x – 1x3 + 4x2 – x – 4 = 0 y = x3 – 4x2 – 5x = 5 0 = x3 – 4x2 – x – 4y = -4x – 1 x 0 1  y -1 -5  x = -4 x = 1  |  |  |
|  | C:\Users\Nzambia\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\19.jpg |