**121/1 MATHS PAPER 1 MARKING SCHEME DECEMBER EXAM 2021**

|  |  |  |  |
| --- | --- | --- | --- |
| **1.** | **Numerator:**  **Denominator:** | **M1**  **M1**  **A1** | **Numerator**  **Denominator** |
|  |  | **03** |  |
| **2.** | **N;(**  **D;** | **M1**  **M1**  **A1** | **Numerator**  **denominator** |
|  |  | **03** |  |
| **3.** | **UK**  **=** | **M1**  **M1**  **A1** | **Expression**  **Expression**  **CAO** |
|  |  | **03** |  |
| **4.** |  | **M1**  **M1**  **A1** | **Comparing powers** |
|  |  | **03** |  |
| **5.** |  | **M1**  **M1**  **A1** | **Equation**  **Expression** |
|  |  | **03** |  |
| 6. | |  |  | | --- | --- | | No. | Log | | 2 | 0.3010 | | 0.324 | + | | 1.7642 | 0.2465 x 2  0.4930 - | | 5.42 | 0.7340 +  1.2270 | |  |  |   0.4428 | M1  M1  A1 | All logs correct  Attempt to divide |
|  |  | **03** |  |
| 7. | K:\scan 2017\Scan 2017.jpg | B1  B1  B1 | **2y<x +4**  **4y ≥ - x- 4**  **x≤2** |
|  |  | **03** |  |
| **8.** | **Midpoint (** | **M1**  **M1**  **A1** |  |
|  |  | **03** |  |
| **9.** | **LCM = 900 = 22 x 32 x 52**  **36 = 22 x 32**  **60 = 22 x 3 x 5**  **Least possible number = 2 x 3 x 52 = 150** | **B1**  **B1**  **B1** | **GCD/LCM**  **36/60** |
|  |  | **03** |  |
| **10.** |  | **M1**  **M1**  **A1** |  |
|  |  | **03** |  |
| **11.** |  | **M1**  **M1**  **A1** | **Substitution**  **For both** |
|  |  | **03** |  |
| **12.** | (a) 5 Tan θ =  4  3  3DFDCAB7.jpg(b) Cos (180 – θ) = - | B1  B1  B1 |  |
|  |  | **03** |  |
| **13.** |  | B1  B1  B1 | **Complete net, well labelled** |
|  |  | **03** |  |
| **14.** |  | **M1**  **M1**  **A1** |  |
|  |  | **03** |  |
| **15.** | **(i)**  **<BOD = 2 <DAB = 2 x 87 = 1740**  **(ii)** | **B1**  **B1**  **B1**  **B1** | **<AOB**  **Property**  **<ADT**  **Property** |
| **16.** | **(i)**  **(ii)** | **M1**  **M1**  **A1**  **B1** |  |
|  |  | **04** |  |
| **17.** | **(a) Distance after 30mins**  **Relative**    **= 20km/hr**  **=**  **(b)**  **(c)** | **M1**  **M1**  **M1**  **M1**  **A1**  **M1**  **A1**  **M1**  **M1**  **A1** | **For both distance**  **Relative distance**  **Relative speed**  **Relative time** |
|  |  | **10** |  |
| 18. | 1. **OP** = ***a*** + (***b*** – ***a***)   = ***a*** + ***b***  **BQ** = ***a*** – ***b***   1. (i) **OC** = *h*   =  **OC** = ***b*** + *k*  = *k****a*** + (1 – *k*)***b***  *h* =  *h = k*  *h =* 1 – *k*  *k* = 1 – *k*  2*k* = 3 – 3*k*  5*k* = 3  *k* = *h* =  (ii) **OC** =  =  (iii) BC: CQ = :  BC:CQ = 3:2 | B1  B1  M1  M1  M1  M1  A1  M1  A1  B1 |  |
|  |  | **10** |  |
| **19.** | |  |  |  | | --- | --- | --- | |  |  | **fd** | | **9.5** | **19** | **0.2** | | **24.5** | **539** | **1.1** | | **44.5** | **2225** | **2.5** | | **69.5** | **1668** | **0.8** | | **89.5** | **179** | **0.2** | |  |  |  |   **ACD72F3B.jpg**  **Total area = 2 + 22 + 50 + 24 + 2 = 100**  **50 – (2 + 22) = 26+26 = 2.5 x y, y = 10.4**  **Median = 34.5 + 10.4**  **= 44.9** | **B1**  **M1**  **A1**  **B1**  **S1**  **B1**  **B1**  **B1**  **B1**  **A1** | **fx**  **f.d**  **scale**  **For median line** |
|  |  | **10** |  |
| 20. | a)   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | x | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | | y | 30 | 13 | 2 | -3 | -2 | 5 | 18 | 37 |   b)    c) i) x = + 0.4  x = -1.7 + 0.1  ii) y = 3x2 + 4x – 2  0 = 3x2 + 7x + 2  y = -3x – 4  x = -2 or x = -0.4 + 0.1 | B2  B1  B1  B1  B1  L1  B1 | All ✓  at least 6 ✓  For equation of line  For ✓ line drawn |
|  |  | 10 |  |
| 21. | 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 |
|  |  | 10 |  |
| 22. | a)    b) 2.1 + 0.1cm  200km, 210km, 220km  c) i) Bearing of M from N = 0100 + 10  ii) Bearing of N from M = 1900 + 10 | S1  B1  B1  B1  B2  M1  A1  B1  B1 | 1cm rep.100km  <300 at P  <450 at Q  ✓positions of PQM and N  ✓labelling 540km, 360km, 500km all✓ |
|  |  | 10 |  |
| **23.** | **(b)**  **(ii) Volume of frustum** | **M1**  **A1**  **M1**  **M1**  **A1**  **M1**  **M1**  **A1** |  |
|  |  | **10** |  |
| **24.** | **(i)**  **(ii)**  **(c)**  **Maximum speed,** | **M1**  **M1**  **A1**  **M1**  **A1**  **B1**  **M1**  **A1**  **M1**  **A1**  **M1**  **A1** | **For both** |
|  |  | **10** |  |