**121/2**

**MATHEMATICS**

**PAPER 2**

**SEPTEMBER 2021**

***CASPA 2021 MATHS F4 P2***

MARKING SCHEME

| **NO** | **WORKING** | **MARKS** | **COMMENT** |
| --- | --- | --- | --- |
| **1** | 0.01583  V =  **V = 63.17** | M1  A1 |  |
|  |  | 2 |  |
| **2** | Log (7X – 3) + 2 Log 5 - Log (X+3) = 2  Log = 2  102 =  100x +300 = 175x -75  X =15 | M1  M1  A1 |  |
|  |  | 3 |  |
| **3** | P = k + cQ2  40 = k + 4c  65 = k + 9c  c = 5, k = 20  p = 20 + 5 Q2 | M1  A1  B1 | **Both eqns**  **Both values** |
|  |  | 3 |  |
| **4** | 1(-**+ 6**(-**+15**(-**+20**(-  **1 -+** -  1 - **-**  **0.9760** | M1  M1  M1  A1 |  |
|  |  | 4 |  |
| **5** | 11 + 5 | M1  M1  A1 |  |
|  |  | 3 |  |
| **6** | **=**  **x2 -6x +9 = 2x2 -13x +15**  **(x-6)(x-1) = 0**  **x = 6 or x = 1**  **13:87 or 1:1** | M1  M1  A1  B1 |  |
|  |  | 4 |  |
| **7** | 122 + (r-8)2 = r2  r  12  r-8  144 + r2 – 16r +64 = r2  R = 13 | M1  M1  A1 |  |
|  |  | 3 |  |
| **8** | x2 – ½ x + (¼ )2 =3 + (¼ )2  (x – ¼ )2 = ±  **x = 0r -4** | M1  M1  A1 |  |
|  |  | 3 |  |
| **9** | **y = b – bx**  **+ bx = b + ay**  **x2 =**  **x =** | M1  M1  A1 | ✓formation of the equations  ✓attempt to solve |
|  |  | 3 |  |
| **10** | Min area = ½ × 4.5 × 3.5 = 7.875  Max area = ½ × 5.5 × 4.5 = 12.375  Absolute Error = ½ (7.875 + 12.375)  Percentage Error = × 100% = 84.38% | M1  M1A1 |  |
|  |  | 3 |  |
| **11** | **½**  **=**  **½ = ½**  **½ =**  **=**  **X = 3 , y = -4** | M1  M1  M1  A1 |  |
|  |  | 4 |  |
| **12** | x2 +6x + 9 + y2 – 10y +25 = 30 + 9 + 25  (x + 3)2 + (y – 5)2 = 82  Centre (-3, 5) Radius = 8 units | M1  M1  A1 |  |
|  |  | 3 |  |
| **13** | Let 5x = y  y2 -6y + 5 = 0  (y – 5) (y – 1) = 0  y = 5 or 1  5x  = 5 or 5x = 1  x = 1 or x = 0 | M1  A1  B1 |  |
| **14** | **= 155** | M1A1 |  |
|  |  | 2 |  |
| **15** | y = 2x – 3  x2 – x(2x – 3) = -4  (x – 4) (x – 1) = 0  x =4 or x = 1  y = 5 or y = -1 | M1  M1  A1  B1 |  |
|  |  | 4 |  |
| **16** | 31500 + (31500  **) = 44,100**  **= 1,837.50** | M1  M1A1 |  |
|  |  | 3 |  |
| **17** | 1. a + d = ar3   a + 9d = ar6   1. r3 =   a + 9d = a(  **a2 + 9ad = a + 2ad + d2**  **7a = d**  **r3 = = 8**  **r = 2**   1. ar9 = 5120   a(29) = 5120  a = 10  d = 70   1. S20  =   10(20 + 1330)  13,500 | B1  B1  M1  M1  M1  A1  M1  A1  M1  A1 | a and d |
|  |  | 10 |  |
| **18** | 1. 480 =   **K = 802**  **R =**   1. **i. R =**   5,000   1. R1 =   R1 = 131.25  Change in R =  % Change in R =  64.0625% | M1  M1  A1  M1M1  A1  M1  M1  M1  A1 |  |
|  |  | 10 |  |
| **19** | 1. 9,680 ×10% = 968   9,120 × 15% = 1,368  9,120 ×20% = 1,824  9,120 × 25% = 2,280  62,960 × 30% = 18,888  Total = 25,328  Net tax = 25, 328 – (1,056 + 15% of 2,500)  23,897   1. 100, 000 – (23,897 + 2,500 + 4,800 + 5,000 + 2,800)   61, 003 | M1  A1  M1  M1  M1  M1  A1  M1M1  A1 |  |
|  |  | 10 |  |
| **20** | 1. =   a = 1 b = 1.5  c =0 d = 1  =  b.    =  x = -1  y = -1 z = -1.5  = | B1  B1  B1  B1  B1  B1 |  |
|  |  | 10 |  |
| **21** | 1. i. **QR =** c – b   ii. **PM =**   1. **RL** = 2. **PX** =   **PX**= k b + (1 – k) c  = k b + (1 – k) c  h = 1 – k  k = 1 – k  k =  h = | B1  B1  B1  B1  B1  B1  B1  B1  B1 | One unknow  For both values |
|  |  | 10 |  |
| **22** | 1. i. (**×)+**(**×)+**(**×)=**(**×)**   **+ + +**    (**×) +** (**×)**  **+ =**  (**×)** | M1  M1  A1  M1  A­1  M1  A1 |  |
|  |  | 10 |  |
| **23** | 1. <MLN = 400 (angles subtended by the same arc NL are equal 2. <OLN = 250  (650 – 400) 3. <LNP = 650 (40+25 angles subtended in alternate segment) 4. <MPQ = 100 (1800-(130+40)) 5. <KNQ = 500 (Supplementary angles) |  |  |
|  |  | 10 |  |
| **24** | |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | X0 | 00 | 150 | 300 | 450 | 600 | 750 | 900 | 1050 | 1200 | 1350 | 1500 | 1650 | 1800 | | Sin 2x | 0.00 | **0.50** | **0.87** | **1.00** | 0.87 | **0.50** | **0.00** | **-0.50** | -0.87 | **-1.00** | **-0.87** | **-0.50** | 0.00 | | Sin (2x+30)0 | 0.50 | **0.87** | **1.00** | **0.87** | 0.50 | **0.00** | **-0.50** | **-0.87** | -1.00 | **-0.87** | **-0.50** | **0.00** | 0.50 |      1. x = 37.50, x = 127.50 2. a translation of 3. amplitude a   Period | | |