**Term 1 - 2023**

**MATHEMATICS (121/1)**

**PAPER 1**

**FORMFOUR (4)**

**Time: 2 ½ Hours**

**MARKING SCHEME**

|  |  |  |  |
| --- | --- | --- | --- |
| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  |

|  |  |
| --- | --- |
| **Number** | **Logarithm**  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

 | M1M1M1A1 | All logs 🗸🗸+/- of logs 🗸 multiplication by 2 and  |
|  | **Total**  | **4** |  |
|  |  | M1M1A1 | Express numbers in simplest index form |
|  | **Total** | **3** |  |
|  | LCM of 42, 56 and 84

|  |  |  |  |
| --- | --- | --- | --- |
| 2 | 42 | 56 | 84 |
| 2 | 21 | 28 | 42 |
| 2 | 21 | 14 | 21 |
| 3 | 21 | 7 | 21 |
| 7 | 7 | 7 | 7 |
|  | 1 | 1 | 1 |

LCMLCM  | M1M1M1A1 | Expression for LCM of 42, 56 and 84Number of clients per teller |
|  | **Total**  | **4** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | In Ksh | M1M1A1 |  |
|  | **Total** | **3** |  |
|  | Difference in profit | M1M1A1 |  |
|  | **Total** | **3** |  |
|  | ∠ obtuse =  | B1B1 |  |
|  | **Total**  | **3** |  |
|  |  | B1B1B1 | For For 🗸 number line drawn |
|  | **Total** | **3** |  |
|  | 2 litres = Let the volume of the smaller pail be cm3 | M1M1A1 | Volume scale factorEquating volumes to volume scale factor592.59 seen |
|  | **Total**  | **3** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | NumeratorDenominator  | M1M1A1 |  |
|  | **Total** | **3** |  |
|  |  | M1A1 | Equation to 900 |
|  | **Total** | **3** |  |
|  |   | M1A1M1A1 |  |
|  | **Total** | **4** |  |
|  |  | B1B1B1B1 | 1200 constructed at L or 600 at KLocating M and N and completing the rhombusKM=7.8 cm ±0.1 cm iAccept 17.325 or 17.775 |
|  | **Total** | **4** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  |  | B1M1A1 |  |
|  | **Total** | **3** |  |
|  | From  | M1A1B1 | Substituting into Value of Value of  |
|  | **Total** | **3** |  |
|  | Total earning | M1M1A1 | Both commissions |
|  | **Total** | **3** |  |
|  |  | B1B1 | Solid completed correctlyHidden lines shown broken |
|  | Total  | 2 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | 1. (i) Angle QPR

(ii) Length PS ∠ ∠    Consider ΔPSR1. Area of garden

Area=7 704 ha | M1A1M1M1M1M1A1M1M1A1 | Expression for  seen🗸 attempt to find ∠Expression for PRCosine rule applied on ΔPSR for PS seenA0 if  |
|  | **Total** | **10** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | 1. Gradient of

From 1. Equation of
2. Coordinates of Q

From Hence 1. Equation of
2. Coordinates of -intercept for

At -intercept, Hence  | B1M1M1A1M1A1B1M1A1B1 | 🗸 attempt to solve for one variable and seenIn coordinate form B0 if not in coordinate form |
|  | **Total** | **10** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | 1. Scale drawing

1. Using scale drawing
2. Locating S

S | S1B1B1B1B1B1B1B1B1B1 | Given scale used🗸 location of Q🗸 location of RAccept 8.1 cm or 8.3 cmAccept 162 km or 166 kmAccept or Lines due east from P and due south from Q drawnS marked |
|  | **Total** | **10** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | 1. Complete table

|  |  |  |  |
| --- | --- | --- | --- |
| Height(cm) |  |  |  |
| 138 – 142  | 140 | 3 | 420 |
| 143 – 147 | **145** | 8 | **1160** |
| 148 – 152  | **150** | 12 | **1800** |
| 153 – 157 | **155** | 20 | **3100** |
| 158 – 162 | 160 | 30 | 4800 |
| 163 – 167 | **165** | 14 | **2310** |
| 168 – 172 | **170** | 7 | **1190** |
| 173 – 177 | **175** | 4 | **700** |
| 178 – 182 | 180 | 2 | 360 |
|  |  | Ʃ | Ʃ |

1. Mean
2. Histogram

1. Median

Area of all the bars = Median First 4 barsRemainder to medianMedian lies in the 5th bar (157.5 – 162.5) | B1B1B1B1M1A1B1B1M1M1A1 | Missing all 🗸Missing all 🗸Ʃshown ƩshownAxes 🗸All bars 🗸Remaining area to medianEquating remaining area to area of bar  |
|  | **Total** | **10** |  |
| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | 1. (i) Distance from Athi River Town to meeting point

At 10.35 a.m. – minibus coveredRelative distanceRelative speed Relative timeMinibus distance to meeting point from 10.35 a.m.Distance from Athi River(ii) Meeting time   1. Distance from B to motorist’s home

Time taken by minibus to reach BusiaArrival timeTime taken by motorist to reach Busia | M1M1M1M1M1A1B1M1M1M1A1 | Distance by minibus at 10.35 a.m.Relative distance and relative speedRelative timeMinibus distance to meeting point as from 10.35 a.m.Addition to 210 kmMinibus arrival time at BusiaTime taken by car to travel to Busia |
|  | **Total** | **10** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | 1. Reflection

Along 1. Δ

, and 1. Δ
2. Oppositely congruent triangles
* Δ and Δ
* Δ and Δ
* Δ and Δ
* Δ and
* Δ and Δ

Δ and Δ | B1B1B1B1B1 B1B1B1B1B1 | ReflectionAlong Line drawnΔ drawnRotation implied Coordinates statedEnlargement Δ drawnFirst pairSecond pair |
|  | **Total** | **10** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | 1. Quadratic equation

Hence m1. Completing the square

Either Or  | M1M1A1M1M1A1B1M1M1A1 | Grouping the 2 factorsExpansion  seenExpression for areaQuadratic formula or completing the square or factorization Both values50 seenCompleting the squareSquare root of right hand sideBoth values 🗸 |
|  | **Total** | **10** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | 1. (i) ∠=∠

 ∠ ∠∠ ∠ Sum of angles on a straight line is 1800(ii) ∠ Reflex ∠ Angle subtended at the centre is twice angle subtended at the circumference by chord BCD1. ∠

The angle between a chord and a tangent is equal to the angle subtended by the same chord on the circumference of the alternate segment.1. Let the length AD be cm

Hence cm  | B1B1B1B1B1B1B1B1M1A1 |  |
|  | **Total** | **10** |  |