**Term 1 - 2023**

**MATHEMATICS (121/1)**

**PAPER 1**

**FORMFOUR (4)**

**Time: 2 ½ Hours**

**MARKING SCHEME**

|  |  |  |  |
| --- | --- | --- | --- |
| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | |  |  | | --- | --- | | **Number** | **Logarithm** | |  |  | |  |  | |  |  | |  |  | |  |  | | M1  M1  M1  A1 | All logs 🗸  🗸+/- of logs  🗸 multiplication by 2 and |
|  | **Total** | **4** |  |
|  |  | M1  M1  A1 | 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 |   LCM  LCM | M1  M1  M1  A1 | Expression for LCM of 42, 56 and 84  Number of clients per teller |
|  | **Total** | **4** |  |

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| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | In Ksh | M1  M1  A1 |  |
|  | **Total** | **3** |  |
|  | Difference in profit | M1  M1  A1 |  |
|  | **Total** | **3** |  |
|  | ∠ obtuse = | B1  B1 |  |
|  | **Total** | **3** |  |
|  |  | B1  B1  B1 | For  For  🗸 number line drawn |
|  | **Total** | **3** |  |
|  | 2 litres =  Let the volume of the smaller pail be cm3 | M1  M1  A1 | Volume scale factor  Equating volumes to volume scale factor  592.59 seen |
|  | **Total** | **3** |  |

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| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | Numerator  Denominator | M1  M1  A1 |  |
|  | **Total** | **3** |  |
|  |  | M1  A1 | Equation to 900 |
|  | **Total** | **3** |  |
|  |  | M1  A1  M1  A1 |  |
|  | **Total** | **4** |  |
|  |  | B1  B1  B1  B1 | 1200 constructed at L or 600 at K  Locating M and N and completing the rhombus  KM=7.8 cm ±0.1 cm i  Accept 17.325 or 17.775 |
|  | **Total** | **4** |  |

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| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  |  | B1  M1  A1 |  |
|  | **Total** | **3** |  |
|  | From | M1  A1  B1 | Substituting into  Value of  Value of |
|  | **Total** | **3** |  |
|  | Total earning | M1  M1  A1 | Both commissions |
|  | **Total** | **3** |  |
|  |  | B1  B1 | Solid completed correctly  Hidden lines shown broken |
|  | Total | 2 |  |

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| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | 1. (i) Angle QPR   (ii) Length PS  ∠  ∠        Consider ΔPSR   1. Area of garden   Area=7 704 ha | M1  A1  M1  M1  M1  M1  A1  M1  M1  A1 | Expression for  seen  🗸 attempt to find ∠  Expression for PR  Cosine rule applied on ΔPSR for PS  seen  A0 if |
|  | **Total** | **10** |  |

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| **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 | B1  M1  M1  A1  M1  A1  B1  M1  A1  B1 | 🗸 attempt to solve for one variable  and seen  In coordinate form  B0 if not in coordinate form |
|  | **Total** | **10** |  |

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| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | 1. Scale drawing      1. Using scale drawing 2. Locating S   S | S1  B1  B1  B1  B1  B1  B1  B1  B1  B1 | Given scale used  🗸 location of Q  🗸 location of R  Accept 8.1 cm or 8.3 cm  Accept 162 km or 166 km  Accept or  Lines due east from P and due south from Q drawn  S marked |
|  | **Total** | **10** |  |

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| **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 bars  Remainder to median  Median lies in the 5th bar (157.5 – 162.5) | B1  B1  B1  B1  M1  A1  B1  B1  M1  M1  A1 | | Missing all 🗸  Missing all 🗸  Ʃshown  Ʃshown  Axes 🗸  All bars 🗸  Remaining area to median  Equating 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 covered  Relative distance  Relative speed  Relative time  Minibus 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 Busia  Arrival time  Time taken by motorist to reach Busia | | | M1  M1  M1  M1  M1  A1  B1  M1  M1  M1  A1 | | Distance by minibus at 10.35 a.m.  Relative distance and relative speed  Relative time  Minibus distance to meeting point as from 10.35 a.m.  Addition to 210 km  Minibus arrival time at Busia  Time taken by car to travel to Busia | |
|  | **Total** | | | **10** | |  | |

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| **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 | B1  B1  B1  B1  B1  B1  B1  B1  B1  B1 | Reflection  Along  Line drawn  Δ drawn  Rotation implied  Coordinates stated  Enlargement  Δ drawn  First pair  Second pair |
|  | **Total** | **10** |  |

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| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | 1. Quadratic equation   Hence m   1. Completing the square   Either  Or | M1  M1  A1  M1  M1  A1  B1  M1  M1  A1 | Grouping the 2 factors  Expansion  seen  Expression for area  Quadratic formula or completing the square or factorization  Both values  50 seen  Completing the square  Square root of right hand side  Both values 🗸 |
|  | **Total** | **10** |  |

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| **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 BCD   1. ∠   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 | B1  B1  B1  B1  B1  B1  B1  B1  M1  A1 |  |
|  | **Total** | **10** |  |