MALIET FORM 3

**MATHEMATICS**

**MARKING SCHEME**

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

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| **Number** | **Standard form** | **Log** |  |
| 8492.41 | $$8.496×10^{2}$$$$2.41×10^{0}$$ | $$2.9292$$ +0.3820 |  |
|  |  | 3.3112 | M1 |
| 3941 | $$3.941×10^{3}$$ | 3.59563.3112-3.5956  |  |
|  |  | $$-1.7156$$ | M1 |
| 0.8039 | $$8.039×10^{-1}$$ | $$\overbar{1}.7156×\frac{1}{3}$$$$\frac{\overbar{3}}{3}+\frac{2.7156}{3}$$$$\overbar{1}.9052$$ | M1A1 |

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| **2** | X: y: Z4 : 7 x 55 : 3 x 720 : 35 : 21 | M1A1**02** |  |
| **3.** |  4y = -2x + 8Y = - ½ x + 2 M2 = 2$$\frac{y-2}{x-3}=2$$$$y=2x-1$$ | M1M1A1**03** |  gradient |
| **4.** |  | M1M1A1**03** | 🗸 Numerator🗸Denominator |
| **5.** | 100 x 84.2083 8420.83 – 40,000 = 44208.30 £ =  = 327 | M1M1M1A1**04** |  |
| **6** |  P³q = nq – M  P³q – nq = - M q(P³ - n) = -M   3 | M1M1A1 | Correct removal of  |
| **7** |    = (1, 13)   | M1M1A13 |  |
| **8** | $$log\_{3}\left(x+24\right)-log\_{3}9=log\_{3}\left(9-2x\right)$$ $log\_{3}\frac{x+24}{9}=log\_{3}9-2x$ $\frac{x+24}{9}=9-2x$ $x+24=81-18x$ $19x=57$ $x=3$ |  |  |
| **9** | $$AX.XC=DX.XB$$ $6XY=\frac{4.8X5}{6}$$$Y=6$$$$XC=4cm$$$$BT^{2}=TCXTA$$$$8X18=144$$$$BT^{2}=144$$$BT=12$cm |  |  |
| **10** | Max value length=8.65,min length=8.55Max value width=5.35,min width=5.25Max area =8.65x5.35=46.2775Min area=8.55x5.25=44.8875Actual area=8.6x5.3=45.58Absolute error =$\frac{46.2775-44.8875}{2}=0.695$%error=$\frac{0.695}{45.58}x100=1.524\%$ | M1M1A1 |  |
| **11** | x + y = 10(10y + x ) – (10x + y) = 549y - 9x = 54 y – x = 6 x + y = 10-x + y = 6 2y = 16 y = 8 x = 2 Number is 28 | M1M1A1 |  |
| **12** | $$\frac{5-2\sqrt{3}}{2+3\sqrt{3}}x\frac{2-3\sqrt{3}}{2-3\sqrt{3}}=\frac{10-15\sqrt{3}-4\sqrt{3}+18}{4-27}$$$\frac{28-19√3}{-23}$=$\frac{19√3}{23}$-$-\frac{28}{23}$ |  |  |
| **13** |  9 25 i) Sin A =9/25 ii) Tan (90-A) =16/9 16 | M2M1 |  |
| **14** | $$x-50+2x+20=180$$$$3x-30=10$$$$3x=210$$$$x=70$$Exterior angle is 70-50=20$ $$$\frac{360}{n}=20$$$$n=\frac{360}{20}=18 sides$$ | M1M1A1 |  |
| **15** |  | M1M1A1 |  |
| **16** | 9:50-9:00=50minutesDistance covered by the bus when matatu started is;60x50/60=50kmRelative speed=60+60=120Remaining distance=290-50=240Time=distance /speed240/120=2hrsDistance =(60x2)+50=170km. | M1M2A1 |  |
|  | SECTION II |  |  |

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| 17 | x $α\frac{y^{2}}{\sqrt{z}} \rightarrow $ x = $\frac{ky^{2}}{\sqrt{z}}$x = 20 when y =5 and c = 920 = $\frac{k × 5^{2}}{\sqrt{9}}$= $\frac{25k}{3}$K = $\frac{3 ×20}{25}$K = $\frac{12}{5}$x = $\frac{12}{5}\frac{y^{2}}{\sqrt{z}}$x = $\frac{12 × 7^{2}}{5 \sqrt{25}}$x = $\frac{12}{5}×\frac{49}{5}$= 23.52(b) y1 = 1.1uz1= $\sqrt{0.81z}$ x1 = $\frac{k\left(1.1y\right)^{2}}{\sqrt{0.81z}}$= k $\frac{1.21 y^{2}}{0.9 \sqrt{z}}$= k 1.3444 $×$100134.44.34.44% increase | B1M1A1M1A1B1M1M1M1A1 | SubstitutionSubstitutionAccept alternative method |
| 18 | (a) a+2d, a+8d, a+24d | B1M1M1M1M1A1A1M1A1M1A1 | For substitution or equivalent  |
| 19 | 1. Original Amount to be paid

 = $\frac{480000}{x}$1. New Amount to be paid

$$\frac{480000}{x-4 }$$b. $∴\frac{480000}{x-4 }-\frac{480000}{x}=20000 $ $$\frac{480000x-480000x+1920000}{x(x-4)}=20000$$$$\frac{20000(x^{2}-4x)}{2000}=\frac{1920000}{2000}$$$$x^{2}-4x=96$$Solving for x; Either x = 12 or x = -8 Since people cannot be –ve, x = 12 members People contributed .12-4=8 peoplec. $\frac{480000}{12}:\frac{480000}{8}$=2:3d. $\frac{6}{8}=0.75ha$ | B1 B1M1M1M1 M1A1 A1M1A1 |  |
| 20 | C:\Users\ADMIN\Pictures\2016-10-01\128.jpg |  |  |
| 21 | 1.

-4x+12=5y4x+5y=121. G of L2=3

 Angle formed by L2 and x-axis =Tan-1 3=71.570 Angle formed by L1 and x-axis Tan-1-0.8 =38.660 180-(71.57+38.66) =69.7701. G of perpendicular line =

4y-4=5x-104y=5x-6 | M1M1A1M1M1M1A1M1M1A1 |  |
| 22 |  |  |  |
| 23 |  |  |  |
| 24 | (a) $\left(\begin{matrix}2&5\\4&3\end{matrix}\right)$Determinant = (2 x 3) – ( 4 x 5)= 6 – 20 = -14Inverse = $-\frac{1}{14}$ $\left[\begin{matrix}3&-5\\-4&2\end{matrix}\right]$Let L be the cost of hiring a lorry and Sh. b be that of hiring a bus(b) (i) 2L + 5b = 1560004L + 3b = 137000(ii) $\left[\begin{matrix}2&5\\4&3\end{matrix}\right]\left[\begin{matrix}L\\b\end{matrix}\right]=$ $\left[\begin{matrix}156000\\137000\end{matrix}\right]$-$\frac{1}{14}\left[\begin{matrix}3&-5\\-4&2\end{matrix}\right]\left[\begin{matrix}2&5\\4&3\end{matrix}\right]\left[\begin{matrix}l\\b\end{matrix}\right]=-\frac{1}{14}\left[\begin{matrix}3&-5\\-4&2\end{matrix}\right]\left[\begin{matrix}156000\\137000\end{matrix}\right]$$\left[\begin{matrix}1&0\\0&1\end{matrix}\right]\left[\begin{matrix}l\\b\end{matrix}\right]$ = -$\frac{1}{14}\left[\begin{matrix}-217000\\-350000\end{matrix}\right]$ $\left[\begin{matrix}l\\b\end{matrix}\right]= \left[\begin{matrix}15500\\25000\end{matrix}\right]$ Lorry = 15500Bus = 25000(c) A singular matrix has a determinant = 0$\left[\begin{matrix}2x-1&1\\x^{2}&1\end{matrix}\right]$ (2x – 1) – x2 = 02x – 1 – x2 = 0x2 – 2x + 1 = 0p = 1s = -2f = -1, -1(x2 – x) – (x + 1) = 0x(x-1) -1 (x -1) = 0x = 1 | M1A1M1M1M1A1 M1A1 | M0 for post multiplication on the right hand side |
|  |  | 10 |  |