**MATHEMATICS 121/2**

**FORM THREE**

**TERM 2 2015**

**MARKING SCHEME**

|  |  |  |
| --- | --- | --- |
| 1No. Log.0.0034 3.5315  0.0245 2.3892Sin54.31 1.9097+- 2.29891.708x 10-1 1.2326 0.1708 | M1M1A1 | All correct logs+ and –Accept 1.708x 10-1 |
|  | **3** |  |
| 2. N: $\frac{10}{3}$ + $\frac{5}{4}$ x $\frac{2}{5}$ = $\frac{23}{6}$ D: $\frac{14}{9}$ x $\frac{9}{4}$ x $\frac{2}{3}$ x $\frac{4}{5}$ =$\frac{ 28}{15}$$\frac{ 23}{6}$ x $\frac{ 15}{28}$ = 2 $\frac{3}{56}$ | M1M 1A1 | For $\frac{23}{6}$For $\frac{28}{15}$Accept 2.054 |
|  | **3** |  |
| 3. A =2πrh + 2$πr^{2}$ but h = 3r **=** 6πr2 + 2$πr^{2}$ =6x$\frac{ 22}{7}$xr2 + 2x$\frac{ 22}{7}$x r2 = 616 **=** $\frac{ 132}{7}$ r2 + $\frac{44}{7}$ r2 = $\frac{ 176}{7}$r2 r = $\sqrt{\frac{616 x 7}{176}}$ 4.95cm | M1M1A1 |  |
|  | **3** |  |
| 4. $\frac{1}{2}$(10)Sin40o(12 + 6) 90Sin40o67.06 | M1M1A1 |  |
|  | **3** |  |
| 5. N: (3t – 5a )(3t + 5a)D**:** (3t + 5a)(2t + 3a)(3t – 5a )(3t + 5a) (3t + 5a)(2t + 3a)(3t – 5a )(2t + 3a) | B1B1A1 |  |
|  | **3** |  |
| 6**.** Buying price = $\frac{90}{100}$ x 2400= 2160$$\frac{2160 x100}{120}$$**=**Sh. 1800 | M1M1A1 |  |
|  | **3** |  |
| 7 T = AI – A$\left(\begin{matrix}-1\\ 2\end{matrix}\right)$ – $\left(\begin{matrix}1\\ 2\end{matrix}\right)$$$\left(\begin{matrix}-2\\ 0\end{matrix}\right)$$ P = PI – T = $\left(\begin{matrix}-3\\ -3\end{matrix}\right)$ **-** $\left(\begin{matrix}-2\\ 0\end{matrix}\right)$ **=** $\left(\begin{matrix}-1\\ -3\end{matrix}\right)$ P(-1, -3) | M1M1A1 |  |
|  | **3** |  |
| 8. |  |  |
|  | **4** |  |
| 9. hypotenuse = $√($242 + 102) Sin x = $\frac{24}{26}$ and Cos x = $\frac{10}{26}$Sin x - Cos x = $\frac{24}{26}$ - $\frac{10}{26}$$$\frac{14}{26}$$ | M1B1M1A1 | Both equationsAllow $\frac{7}{13}$ |
|  | 4 |  |
| 10. 8x = 3x + 6y 8x – 3x = 6y 5x = 6y$$\frac{x}{y}=\frac{6}{5}$$x : y = 6 : 5 | B1A1 |  |
|  | 2 |  |
| 11. $\frac{\left(\sqrt{2}- \sqrt{3}\right)(\sqrt{2}- √3)}{\left(\sqrt{2}+ \sqrt{3}\right)(\sqrt{2}-√3)}$2 - 2$\sqrt{6}+ 3$ 4 - 3 5 - 2$√$6  b = -2 | M1A1B1 |  |
|  | 3 |  |
| 12. 4(4 + y) = 12 x 8 4 + 4y = 24 Y= 20 | M1M1A1 |  |
|  | 3 |  |
| 13. Biasha’s = 360 – (81 + 216) = 84 votes 63o = 84 Total votes = $\frac{360 x 84}{63}$ = 480 Jamal’s votes = $\frac{216 x 480}{300}$ = 288 | M1M1A1 |  |
|  | 3 |  |
| 14. x2 -x = 3x + 3x 2x2 + 4x = 0 2x(x + 2) = 0 X = 0 or x = -2 | M1M1A1 | X(x -1)- 3x(x + 1) = 0FactorizingBoth answers |
|  | 3 |  |
| 15 vol. of cylinder = vol. of sphere$π x$72x5 = $\frac{4}{3}π$r3 r3 = 245 x $\frac{3}{4}$ = 5.75 S A = 4$π$r2 = 4 x 3.142x (5.75)2 = 415.6 cm2 | M1A1M1B1 |  |
|  | 4 |  |
| 16. (a - b)(a + b) (2557- 2547)( 2557 + 2547) 10 x 5101=51010 | B1M1A1 |  |
|  | 3 |  |

**SECTION II**

|  |  |  |
| --- | --- | --- |
| 17. a) $\frac{120}{360}$ x $\frac{22}{7}$ x 212 462cm2 b) $\frac{120}{360}$ x $\frac{22}{7}$ x 42 44 + 42 86 c) i) $\frac{120}{360}$ r x 21 = 462 r = $\frac{462}{66}$ = 7 cm ii) h = $√($ 212 – 72) = 19.8 cm | M1A1M1M1A1M1M1A1M1A1 |  |
|  | 10 |  |
|  18.Area of circle = 22/7x 4x4= 50.27cm2Area of triangle = ½x 8x6 sin300 = 12cm250.27cm2 - 12 cm2 =38.27 cm2 |  |  |
|  |  |  |
| 19.a) $<$ RST = 1800 - 750 1050oppositeanlges of cyclic quadr.b) $<$ SUT = 1800 –(380 + 1190) = 230 angle sum of a triangle c) $<PST$ = 440 subtended by arc/chord PT d) Obtuse $<ROT$ = 1800- (2x15)angle sum of a triangle e) $<SQT$ = 1800 – (900 + 520) angle sum of a triangle | B1B1B1B1B1B1B1B1B1B1 |  |
|  | 10 |  |
| 20.a) Abdullah = $\frac{45}{x}$ orangesVivian = $\frac{45}{x-0.75}$ oranges$\frac{45}{x}$ + $\frac{45}{x-0.75}$$$\frac{45\left(x-0.75\right)+ 45x}{x(x-0.75)}$$$$\frac{90x-33.75}{x(x-0.75)}$$ b)$\frac{45}{x-0.75}$ - $\frac{45}{x}$ = 245x – 45x + 33.75 = 2x(x – 0.75) 33.75 = 2x2 – 1.5x 8x2 – 6x – 153 =o X = $\frac{\pm √(36+4320)}{16}$ = $\frac{6 \pm 66 }{16}$ X= -375 or 4.5 X= Ksh. 4.50 Abdullah Kshs. 4.45 per orange Vivian 4.50 -0.75 Kshs. 3.75 c) Abdullah = $\frac{45}{3.75}$ = 12 oranges Vivian = 14 oranges Total number = 12 + 14 = 26 oranges | B1M1B1M1B1M1A1B1M1A1 | Both expressionsSimplified expressionSimplified equation |
|  | 10 |  |
| 21. a) 102 = 82 + 52n2x8x5cosB Cos B =$\frac{89-100}{80}$ = - $\frac{11}{80}$ B = Cos-1(- $\frac{11}{80}$) = 97.90 b) $\frac{10}{Sin 97.9}$ = 2R R = $\frac{5}{Sin97.9}$ = 5.048 cm c) $\frac{10}{Sin82.1}$ = $\frac{7}{SinA}$ Sin A = $\frac{7}{10}$ Sin 82.1 = 0.6984 A = 43.90$<$ COD = 2x43.9 = 87. 80Area of a sector = $\frac{87.8}{360}$ x $\frac{22}{7}$x 5.0482 = 19.5316Area of triangle = $\frac{1}{2}$ x5.04329Sin 87.8 = 12. 7313Shaded area = 19.5316 -12. 7313 = 6.8 cm2 | M1M1A1M1A1M1M1M1M1A1 |  |
|  | 10 |  |
| 22. a) Total sales= 360 x 500  = Kshs 180, 000 Commission = 180, 000- 100, 000 = .02x80,000 = 1600 Total earnings = 12, 000 + 1600 =Kshs 13, 600 b) i) New salary = $\frac{110}{100}$x12, 000 Kshs 13, 200 Commission paid = 17, 600 – 13, 200 = Kshs 4400 Commission is paid on = 4400x$\frac{100}{2}$ =Kshs. 220, 000 Total sales = 220, 000 + 100, 000 = 320, 000ii) No. of bags = $\frac{320,000}{500}$= 640 | M1M1A1M1M1A1B1M1M1 A1 | $ 12, 000+\frac{10}{ 100}$x12, 000 |
|  | 10 |  |
| 23. a) gradient of the line=$\frac{6-2}{-3-3}$ = $\frac{-2}{ 3}$$\frac{y-2}{x-3}$ = $\frac{-2}{ 3}$ 3y – 6 = -2x + 6 2x + 3y = 12$\frac{2x}{12}$ + $\frac{3y}{12}$ = $\frac{12}{12}$$\frac{ x}{ 6}$ +$\frac{y}{4}$ = 1 b) A(6,0) B(0, 0) c) Area = $\frac{1}{2}$ x 6x4 = 12 sq. units d) y = - $\frac{1}{2}$x + 4 tan $θ$ = $\frac{2}{3}$$θ= $tan-1($\frac{ 2}{ 3}$) =33.690 | M1M1M1A1B1B1M1A1M1A1 | Dividing by 12 |
|  | 10 |  |