KANDARA SUB COUNTY SECONDARY SCHOOLS FORM TWO JOINT EVALUATION

Kenya Certificate of Secondary Education

MATHEMATICS

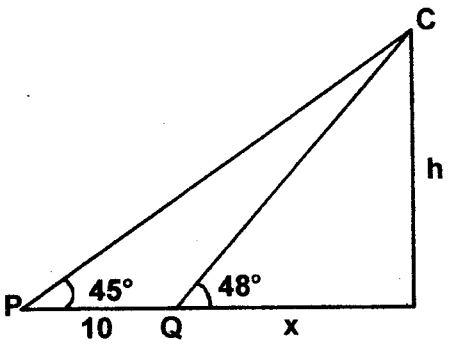
Paper - 121

October/November 2015

Marking Scheme

	ANSWERS	MARKS	REMARKS
1.	No. | $\log_{10}$ 38.61 | 1.5867 7.28 | 0.8621 | 2.4488 413.5 | 2.6165 | $\bar{1}.8323$ | $\bar{1}.8323 \div 2$ | $2 + 1.8323$ | 2 0.8245 | $\leftarrow \bar{1}.9162$ $\therefore \cos x = 0.8245$ $x = 34.46°$	M1 M1 M1 A1 4	for all the ✓ logs for ✓ add & subtraction of logs correct attempt to divide by 2 for correct answer.
2.	$\frac{6}{3x-1} - \frac{2}{x-2}$ $= \frac{6(x-2)-2(3x-1)}{(3x-1)(x-2)}$ $= \frac{6x-12-6x+2}{(3x-1)(x-2)}$ $= \frac{-10}{(3x-1)(x-2)}$	M1 M1 A1 3	for LCM for simplifying.
3.	James new earnings = 9600 - 5600 = 4000 Previous earnings = $\frac{5000}{5} \times 3 = 3000$ Percentage change $= \frac{4000 - 3000}{3000} \times 100$ $= 33\frac{1}{3}\%$	M1 M1 A1 3	

ANSWERS	MARKS	REMARKS
4. $\frac{27.72\times0.3876\times1000000}{2.09\times0.4284\times1000000}$ $\frac{2772\times3876}{209\times4284}=12$	M1 M1A1 3	evidence of cancelling out or use of prime factors ____four M1
5. a) $Grad=\frac{-6-3}{8-2}=\frac{-9}{6}$ $=\frac{-3}{2}$ *or* $1\frac{1}{2}$	B1	
b) $G=\frac{2}{3}$ $\frac{y-3}{x-2}=\frac{2}{3}$ $3y-9=2x-4$ $3y=2x+5$ $y=\frac{2}{3}x+\frac{5}{3}$	M1 M1 A1 4	
6. $\frac{\frac{1}{\sqrt{3}}\times\frac{\sqrt{3}}{2}-\frac{1}{\sqrt{2}}\times\frac{1}{\sqrt{2}}}{\frac{\sqrt{3}}{2}\times\frac{\sqrt{3}}{1}+\frac{1}{2}\times1}$ $=\frac{\frac{1}{2}-\frac{1}{2}}{\frac{3}{2}\times\frac{1}{2}}$ $=\frac{0}{2}$ $=0$	M1 M1 A1 3	for ✓ corr values of numerator for ✓ corr. values of demo.
7. $6x-9=4x-1$ $2x=8$ $x=4$ $L=6(4)-9=15$ $W=2(4)+1=9$ Area $=15\times9=135cm^2$	M1 M1A1 3	

ANSWERS	MARKS	REMARKS
8. $\left(\frac{1}{3^3}\right)^n \times (3^4) = 3^5$	M1	
$-3n - 4 = 5$	M1	
$-3n = 9$ $n = -3$	A1 3	
9. $r = 0.2727\ldots.$ $100r = 27.2727\ldots$		
$100r = 27.2727$ $-\ \ r = -0.2727$ $99r = 27$	M1	
$r = \frac{27}{99}$		
$= \frac{3}{11}$	A1 2	
10. $3x + x - 20° = 180°$	M1	
$4x = 200°$		
$x = 50°$		follow through
Exterior angle $= 50 - 20 = 30°$		
No. of sides $= \frac{360}{30} = 12$ sides	M1A1 3	
11. 		
Tan 45° $= \frac{h}{10+x} \Rightarrow h = (10 + x) \tan 45°$		
Tan 48° $= \frac{h}{x} \Rightarrow h = \tan 48°$	M1	for both ✓ tan 45° and tan 48°

ANSWERS	MARKS	REMARKS
$(10 + x) \tan 45 = x \tan 48°$	M1	
$(10 + x)\ 1 = x \times 1.106$ $10 + x = 1.106x$ $x = 94.34$		
$h = 10 + 94.34$	M1	
$= 104.34$ m	A1 4	
12. Workers days hours 30 6 8 50 ? 6		
No. of days $= \frac{8}{6} \times \frac{30}{50} \times 6$	M1	
$= 4.8$ days	A1 2	
13. $\angle CDF = 180° - (60 + 70)$ $= 50°$	M1	
$\angle ABD = \frac{50}{2} = 25°$	A1 B1 3	
14. $12 = 2 \times 2 \times 3$ $18 = 2 \times 3 \times 3$ $36 = 2 \times 2 \times 3 \times 3$	M1	
G.C.D $= 2 \times 3 = 6$ LCM $= 2 \times 2 \times 3 \times 3 = 36$	M1	
Diff. $= 36 - 6 = 30$	A1 3	
15. S.A. $= \pi r^2 + 2\pi rh$		
$= \frac{22}{7} \times 7 \times 7 + \frac{22}{7} \times 7 \times h \times 2$	M1	
$154 + 44h = 594$	M1	
$44h = 440$		
$h = 10$cm	A1 3	

ANSWERS	MARKS	REMARKS
16. No. of women = 240 No. of men = ¼ of 240 = 120 No. of adults = 240 + 120 = 360 No. of children = 36 × 2 = 720 Total no. of people = 360 + 720 = 1080	 M1 M1 M1A1 4	
SECTION II		
17. a) Value of the bigger cylinder. $= \frac{1}{2} \times \frac{22}{7} \times 7 \times 7 \times 120 = 9240 cm^3$ Volume of the smaller cylinder. $= \frac{1}{2} \times \frac{22}{7} \times 3.5 \times 3.5 \times 120 = 2310\ cm^3$ Volume of solid = 9240 - 2310 = 6930cm³ b) m = e × v = 7.5 × 6930 = 57975g = 51.975g c) Cost = 51.975 × 200 = shs 10395	 M1A1 M1 M1 A1 M1 A1 B1 M1 A1 10	

18.

Mass	Mid-pt (x)	Freq (f)	fx	cf
1 - 5	3	2	6	2
6 -10	8	3	24	5
11 - 15	13	6	78	11
16 - 20	18	8	144	19
21 - 25	23	3	69	22
26 - 30	28	2	56	24
31 - 35	33	1	33	25
Σ		25	410	

a) modal class = 16 - 20 — B1

b) Mean = $\frac{\Sigma fx}{\Sigma f} = \frac{410}{25} = 16.4$ — M1A1

c) Median = $L + \frac{\frac{M}{2} - c.f}{f} \times c$ — M1M1

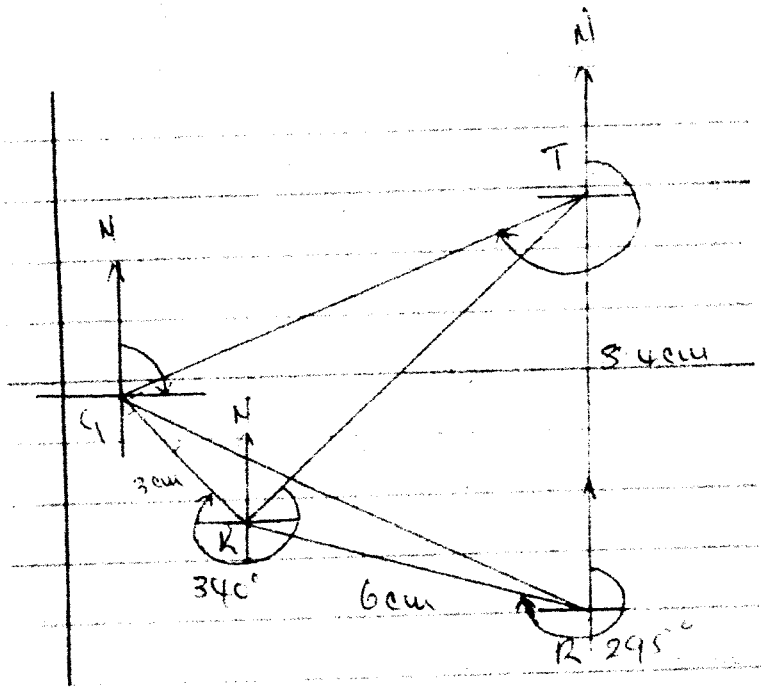
$= 15.5 + \frac{\frac{25}{2} - 11}{8} \times 5$ — A1

= 16.4375

10

ANSWERS	MARKS	REMARKS

19.



a) Distance TK = 8.0 [± 0.1] × 10 = 80 ± 1km — M1A1

Bearing of T from K = 043° ± 1°

or N43°E

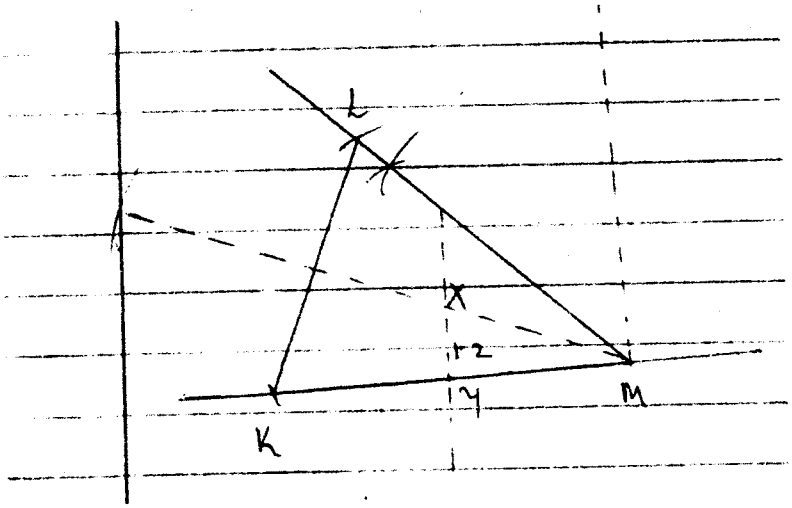
b) Distance GT = 7.1 [± 0.1] × 10 = 71 [± 1] km; — M1A1

Bearing of G from T = 245² ± 1² or S65°E

c) Bearing of R from G = 130° ± 1° — B1B1
[or S 50°W)

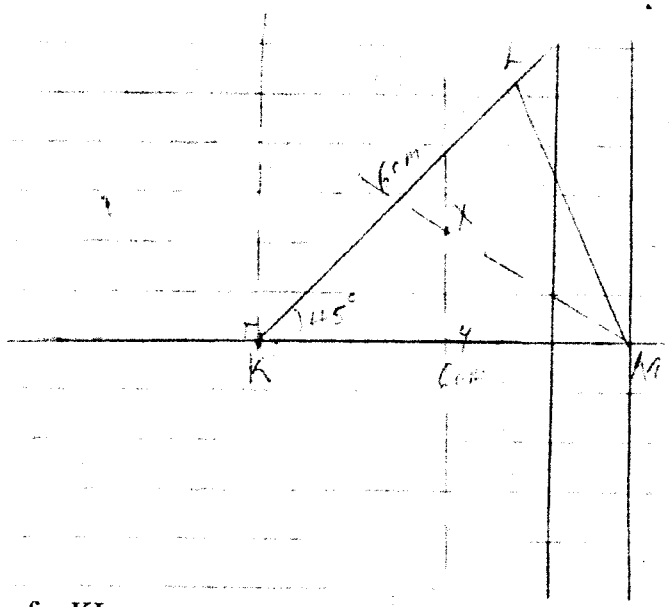
10

20.



a) ML = 4.7cm

ANSWERS	MARKS	REMARKS



for KL	B1	
for angle LMK	B1	
for the DKML	B1	
for the measure of ML	B1	
c) Bisect the angle KML for the bisector	B1	
d) for the perpendicular bisector. KX = 3.6cm	B1	
e) XY = 1.2cm	B1	
f) Area KYX = ½ × 1.2 × 3 = 1.8cm²	M1 A1	
	10	

21. a) $\mathbf{AC} = \begin{pmatrix}9\\4\end{pmatrix} - \begin{pmatrix}3\\4\end{pmatrix} = \begin{pmatrix}6\\0\end{pmatrix}$ — M1A1

b) $2\mathbf{AD} + 3\mathbf{BC} = 2\begin{pmatrix}3\\2\end{pmatrix} + 3\begin{pmatrix}3\\3\end{pmatrix}$ — M1

$= \begin{pmatrix}6\\4\end{pmatrix} + \begin{pmatrix}9\\9\end{pmatrix} = \begin{pmatrix}15\\13\end{pmatrix}$ — M1A1

ANSWERS	MARKS	REMARKS
c) $\frac{1}{2}\mathbf{AB} - 4\mathbf{DC} = \frac{1}{2}\begin{pmatrix}3\\-3\end{pmatrix} - 4\begin{pmatrix}3\\-2\end{pmatrix}$	M1	
$= \begin{pmatrix}1.5\\-1.5\end{pmatrix} - \begin{pmatrix}12\\-8\end{pmatrix}$	M1	
$= \begin{pmatrix}-10.5\\6.5\end{pmatrix}$	A1	
d) $\mathbf{BC} = \begin{pmatrix}3\\3\end{pmatrix}$		
$\lvert\mathbf{BC}\rvert = \sqrt{3^2+3^2} = \sqrt{18}$		
$= 4.243$	A1	
	10	