

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		
	413.5	2.4488	M1	for all the ✓ logs
		<u>2.6165</u>		
1.8323		M1	for ✓ add & subtraction of logs	
	<u>1.8323 ÷ 2</u>			
	2 + 1.8323	M1	correct attempt to divide by 2	
	2			
0.8245	← 1.9162	A1	for correct answer.	
	∴ Cos x = 0.8245	4		
	x = 34.46°			
2.	$\frac{6}{3x-1} - \frac{2}{x-2}$			
	$= \frac{6(x-2) - 2(3x-1)}{(3x-1)(x-2)}$	M1	for LCM	
	$= \frac{6x-12-6x+2}{(3x-1)(x-2)}$	M1	for simplifying.	
	$= \frac{-10}{(3x-1)(x-2)}$	A1		
			3	
3.	James new earnings = 9600 - 5600 = 4000	M1		
	Previous earnings = $\frac{5000}{5} \times 3 = 3000$	M1		
	Percentage change = $\frac{4000 - 3000}{3000} \times 100$ = 33 $\frac{1}{3}$ %	A1		
		3		

ANSWERS

	MARKS	REMARKS
<p>4. $\frac{27.72 \times 0.3876 \times 1000000}{2.09 \times 0.4284 \times 1000000}$ $\frac{2772 \times 3876}{209 \times 4284} = 12$</p>	M1 M1A1 3	evidence of cancelling out or use of prime factors _____ four M1
<p>5. a) $Grad = \frac{-6-3}{8-2} = \frac{-9}{6}$ $= -\frac{3}{2}$ or $1\frac{1}{2}$</p> <p>b) $G = \frac{2}{3}$ $\frac{y-3}{x-2} = \frac{2}{3}$ $3y-9 = 2x-4$ $3y = 2x+5$ $y = \frac{2}{3}x + \frac{5}{3}$</p>	B1 M1 M1 A1 4	
<p>6. $\frac{\frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{2} - \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}}}{\frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{1} + \frac{1}{2} \times 1}$ $= \frac{\frac{1}{2} - \frac{1}{2}}{\frac{3}{2} \times \frac{1}{2}}$ $= \frac{0}{2}$ $= 0$</p>	M1 M1 A1 3	for ✓ corr values of numerator for ✓ corr. values of demo.
<p>7. $6x - 9 = 4x - 1$ $2x = 8$ $x = 4$ $L = 6(4) - 9 = 15$ $W = 2(4) + 1 = 9$ $Area = 15 \times 9 = 135\text{cm}^2$</p>	M1 M1A1 3	

ANSWERS

8. $\left(\frac{1}{3^3}\right)^n \times (3^4) = 3^5$
 $-3n - 4 = 5$
 $-3n = 9$
 $n = -3$

MARKS

REMARKS

M1

M1

A1

3

9. $r = 0.2727 \dots$
 $100r = 27.2727 \dots$
 $100r = 27.2727$
 $- \quad r = -0.2727$
 $\hline 99r = 27$

M1

$r = \frac{27}{99}$

$= \frac{3}{11}$

A1

2

10. $3x + x - 20^\circ = 180^\circ$

$4x = 200^\circ$

$x = 50^\circ$

Exterior angle = $50 - 20 = 30^\circ$

No. of sides = $\frac{360}{30} = 12$ sides

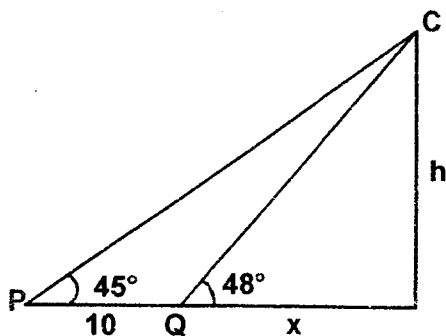
M1

follow through

M1A1

3

11.



$\tan 45^\circ = \frac{h}{10+x} \Rightarrow h = (10+x) \tan 45^\circ$

$\tan 48^\circ = \frac{h}{x} \Rightarrow h = x \tan 48^\circ$

M1

for both $\checkmark \tan 45^\circ$ and $\tan 48^\circ$

ANSWERS

$$(10 + x) \tan 45 = x \tan 48^\circ$$

$$(10 + x) 1 = x \times 1.106$$

$$10 + x = 1.106x$$

$$x = 94.34$$

$$h = 10 + 94.34$$

$$= 104.34 \text{ m}$$

MARKS

REMARKS

M1

M1

A1

4

12. Workers days hours

30 6 8

50 ? 6

$$\text{No. of days} = \frac{8}{6} \times \frac{30}{50} \times 6$$

$$= 4.8 \text{ days}$$

M1

A1

2

13. $\angle CDF = 180^\circ - (60 + 70)$
 $= 50^\circ$

$$\angle ABD = \frac{50}{2} = 25^\circ$$

M1

A1

B1

3

14. $12 = 2 \times 2 \times 3$
 $18 = 2 \times 3 \times 3$
 $36 = 2 \times 2 \times 3 \times 3$ }

G.C.D = $2 \times 3 = 6$
 LCM = $2 \times 2 \times 3 \times 3 = 36$ }

$$\text{Diff.} = 36 - 6 = 30$$

M1

M1

A1

3

15. S.A. = $\pi r^2 + 2\pi rh$

$$= \frac{22}{7} \times 7 \times 7 + \frac{22}{7} \times 7 \times h \times 2$$

$$154 + 44h = 594$$

$$44h = 440$$

$$h = 10 \text{ cm}$$

M1

M1

A1

3

ANSWERS

16. No. of women = 240
 No. of men = $\frac{1}{4}$ of 240 = 120
 No. of adults = 240 + 120 = 360
 No. of children = $36 \times 2 = 720$
 Total no. of people = 360 + 720 = 1080

MARKS

REMARKS

M1
M1

M1A1

4

SECTION II

17. a) Value of the bigger cylinder.
 $= \frac{1}{2} \times \frac{22}{7} \times 7 \times 7 \times 120 = 9240 \text{ cm}^3$
 Volume of the smaller cylinder.
 $= \frac{1}{2} \times \frac{22}{7} \times 3.5 \times 3.5 \times 120 = 2310 \text{ cm}^3$
 Volume of solid = 9240 - 2310
 $= 6930 \text{ cm}^3$
- b) $m = e \times v$
 $= 7.5 \times 6930$
 $= 51975 \text{ g}$
 $= 51.975 \text{ g}$
- c) Cost = 51.975 × 200
 $= \text{shs } 10395$

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
- b) Mean = $\frac{\Sigma fx}{\Sigma f} = \frac{410}{25} = 16.4$
- c) Median = $L + \frac{\frac{M}{2} - c.f}{f} \times c$
 $= 15.5 + \frac{\frac{25}{2} - 11}{8} \times 5$
 $= 16.4375$

B1

M1A1

M1M1

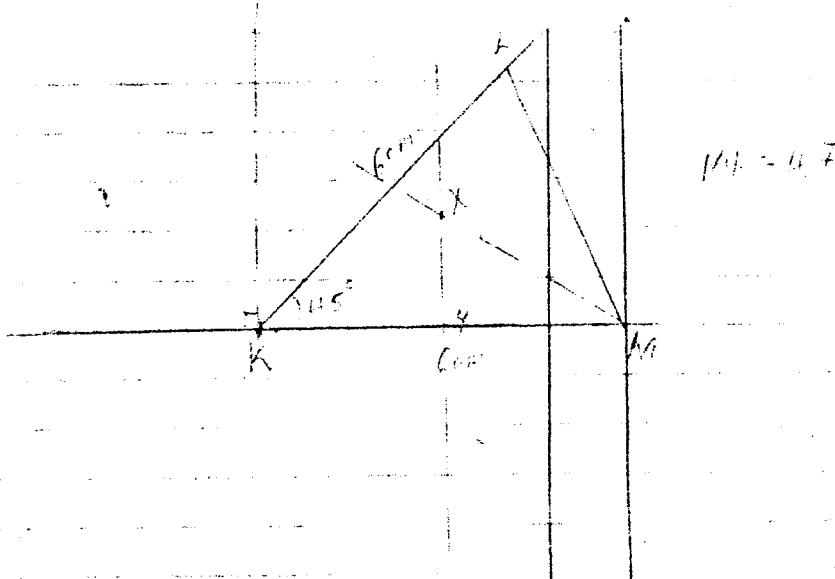
A1

10

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 B1
for the bisector
- d) for the perpendicular bisector. B1
KX = 3.6cm
- e) XY = 1.2cm B1
- f) Area KYX = $\frac{1}{2} \times 1.2 \times 3$ M1
= 1.8cm² A1

10

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

M1A1

b) $2AD + 3BC = 2 \begin{pmatrix} 3 \\ 2 \end{pmatrix} + 3 \begin{pmatrix} 3 \\ 3 \end{pmatrix}$
 $= \begin{pmatrix} 6 \\ 4 \end{pmatrix} + \begin{pmatrix} 9 \\ 9 \end{pmatrix} = \begin{pmatrix} 15 \\ 13 \end{pmatrix}$

M1

M1A1

ANSWERS

$$\begin{aligned} \text{c) } \frac{1}{2} \mathbf{AB} - 4\mathbf{DC} &= \frac{1}{2} \begin{pmatrix} 3 \\ -3 \end{pmatrix} - 4 \begin{pmatrix} 3 \\ -2 \end{pmatrix} \\ &= \begin{pmatrix} 1.5 \\ -1.5 \end{pmatrix} - \begin{pmatrix} 12 \\ -8 \end{pmatrix} \\ &= \begin{pmatrix} -10.5 \\ 6.5 \end{pmatrix} \end{aligned}$$

$$\text{d) } \mathbf{BC} = \begin{pmatrix} 3 \\ 3 \end{pmatrix}$$

$$\begin{aligned} |\mathbf{BC}| &= \sqrt{3^2 + 3^2} = \sqrt{18} \\ &= 4.243 \end{aligned}$$

MARKS**REMARKS**

M1

M1

A1

A1

10