KCSE 2024

MATHS PAPER 1

MARKING SCHEME

	WORK OUT	MKS	COMMENTS
1.	$6(2 \times \frac{22}{5}) = \frac{264}{5}$		
	$\frac{112}{5} \div \frac{264}{5} = \frac{14}{33}$		
	$\frac{1}{2} + \frac{14}{33} = \frac{61}{66}$	M1	
		1411	
	$6(8 \times \frac{3}{22}) = \frac{72}{11}$		
	$\frac{1}{2}x\frac{72}{11} = \frac{36}{11}$	3.54	
		M 1	
	$\frac{61}{66} \div \frac{36}{11} = \frac{61}{216}$	A1	
	66 11 216		
		03	- 110 i
2.	$\frac{(y^2 + x^2)(y + x)(y - x)}{}$	M 1	Simplifying the numerator fully
	y(y + x) (y - x)	M1	numerator runy
	$y^2 + x^2$	141 1	Simplifying the
	y	A1	denominator fully
		03	
3.	$2^{2x-1} \times 2^{-3+3x} = 2^{6x+2}$	M1	All numbers t base
	2x - 1 - 3 + 3x = 6x + 2	M1	two
			All the powers picked
	x = -6	A1	correctly
		03	
4.	Customers selling price		
	= (90 + 24,000	M1	
	100		
	= 21,600		
	100 x 21,600	M1	
	120 = 18.000		
	= 18,000	A1 03	
5.	No. xy	03	
٥.	110. Ay		





	x + y = 12	M1	For the 2 equations
	10y + x - 15 = 2(10x + y) 8(12 - x) - 19x = 15 x = 3 $y = 9Original number 39$	M1 A1 B1	Expressing in one variable For the two
		04	
6.	$9.452^2 = 89.34$	B1	
	$\frac{1}{63.37}$ = 0.01578	В1	
	89.35578	B1	Accept at least 4 sf
		03	

	WORK OUT	MKS	COMMENTS
7.	L.S.F = $\sqrt[3]{\frac{6750}{2000}}$	M1	
	= 1.5 Radius of the large container = (15.5 x 1.5) $x \frac{1}{2}$	M1	
	11.625cm =	A1	
	11.6cm	03	
8.	$AB = \begin{pmatrix} 3 \\ -1 \\ -3 \end{pmatrix} - \begin{pmatrix} 1 \\ 3 \\ -4 \end{pmatrix}$	M1	
	$= \begin{cases} 2 \\ -4 \\ 1 \end{cases} = 2i - 4j + k$ $/AB// = 2^{2} + (-4)^{2} + 1^{2}$	M1	
	$AB// = 2^{2} + (-4)^{2} + 1^{2}$ $\sqrt{=21}$ = 4.583	A1	
		03	
9.	A 30° B		





$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	
$\theta = 23.58^{\circ}$ $n = 180 - 30 - 23.58$ $= 126.42^{\circ}$ $= 306.42^{\circ}$ A1 Bearing = 180 + 126.42 $= 306.42^{\circ}$ B1 Accept N 53.58	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
= 126.42° A1 Bearing = 180 + 126.42 = 306.42° B1 Accept N 53.58	
Bearing = 180 + 126.42 = 306.42 ⁰ B1 Accept N 53.58	
= 306.42 ⁰ B1 Accept N 53.58	
	Q0 11 7
	o~ W
10 3 - 2x < x	
. 3 < 3x B1	
1 < x	
$3x \le 2x + 5$	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
2,3,4,5	
03	
$11 \qquad \underline{4-x} = 1$	
2x + 1 7 M1	
28 - 7x = 2x + 1, x = 3	
v-3 = -7 M1	
$\frac{y-3}{x+1} = -7$ M1	
equivalent	
03	
WART ATM	
WORK OUT MKS COMMENT	rs
WORK OUT MKS COMMENT 12 L	rs .
	rs
12 L	rs
12 L	rs
12 L N	rs
12 L	rs
$\begin{array}{c c} 12 & L \\ N & \\ K & N \end{array}$	CS .
$\begin{array}{c c} 12 & L \\ N & \\ \hline N & \\ \end{array}$	rs
$\begin{array}{c c} 12 & L \\ N & \\ K & N \end{array}$	rs .
$\begin{array}{c c} 12 & L \\ N & \\ K & N \\ \end{array}$	es .
12 L N B1 Q STANK = 30°	:S
$\begin{array}{c c} 12 & L \\ N & \\ K & N \\ \end{array}$	rs .
12 L N K N P Q < LNK = 30° < PNK = 70° M1 A1	rs .
12 L N K N P Q < LNK = 30° < PNK = 70° M1 A1	CS.
12 L N K N P Q < LNK = 300 < PNK = 700 x = 3600 - (300 + 700) M1 A1	CS.
12 L N R P Q < LNK = 30° < PNK = 70°	rs .
L N K N P Q CLNK = 30° CPNK = 70° CPNK = 70° CPNK = 260°	rs .
12 L N R P Q < LNK = 30° < PNK = 70°	CS.
L N K N P Q < LNK = 300 < PNK = 700 x = 3600 - (300 + 700) = 2600 03 13 .	
12	
12	allel
12	allel
12	allel
12	allel ines





14	Volume <u>← 6300</u> 0		
•	7	M1	
	$= 9000 \text{cm}^3$		
	Volume L (15 x 12) - (12 x 10) h = 9000	M1	
	60h = 9000	1,11	
	h = 1.5m	A1	
		03	
15	(a) Jane Mary		
•	5 : 4		
	Dev. Div Re		
	4 : 5 : 6	M1	
	Dev = $\frac{4}{15}$ x 81000	101 1	
	= sh. 21600	A1	
	(b) Div = 5×81000		
	15		
	= 27000		
	Mary got 4 y 27000	M1	
	Mary got <u>4</u> x 27000 9	IVII	
	= 12000	A1	
		04	
16	(a) $D = \frac{1}{2} \times 80 (24 + 16)$	M1	Any other equivalent
•	= 1600m	A1	method
	(b) Decelaration = $\frac{80}{4}$		
	` ' 4	A1	
	= 00m /s ²	AI	
\vdash	$= 20 \text{m/s}^2$	03	
		US	

Section II

17	(a) let the constant amount be x		Any other equivalent
	Peter - $(^{3}/_{8} x) / =$		method
	John's - $^{2}/_{5}(^{5}/_{8}x)$ /=	M1	
	= ½ x /=		
	Remaining $3/8x - 18,000$	M1	
	x = 48,000		
	Therefore the original amount is 48,000		
	(b) John received		
	$(1/4 \times 48,000)$	M1	
	= 12,000/=	A1	
	(c) Business maintenance		
	$(^{1}/_{3} \times 12,000)$	M1	



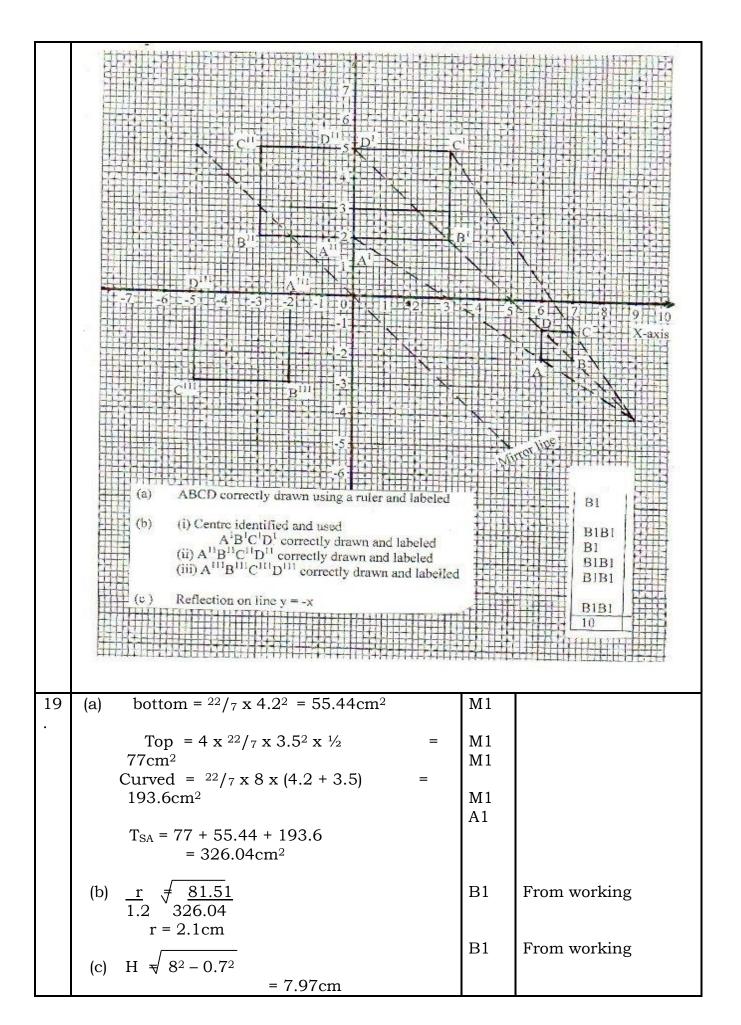


= 4,000/= Balance = 8,000		
Ratios: Peter - $(^3/_8 \times 48,000)$ = Ksh. 18,000/=		
John - (1/4 x 48,000) = 12,000/=	M 1	
Caro - $(^{1}/_{3} \times 18,000)$ = $6,000/=$ Ratio: $18,000:12,000:6,000$ 3 : 2 : 1		
Peter got $^{3}/_{6} \times 8,000 + 18,000$ = Ksh. 22,000/=	M1 A1	
John got 2/6 x 8,000 = Ksh. 14,677/=	B1	
Caro got ¹ / ₆ x 8,000 + 18,000 = Ksh. 7,333/=	B1	
	10	

18	8	
•		







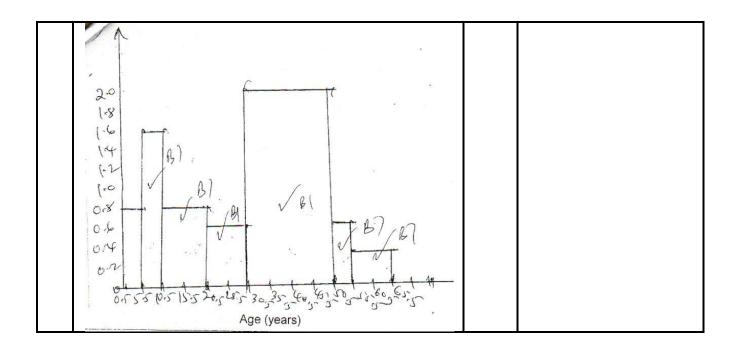




		1	
	C (ii) volume = $\frac{1}{3} \times \frac{22}{7} \times 7.97$ (4.22 +3.5	M1	
	$+4.2 \times 3.5) + \frac{1}{2}x + \frac{4}{3}x + \frac{22}{7}x + 3.5^3$		
	= $\frac{1}{3}$ x $\frac{22}{7}$ x 7.97 x 44.59 + 89.83	M1	
	$= 462.13 \text{ cm}^3$	A1	
		10	
20	(a) (i)		
	Relative speed = $(40 + 60) \text{ km/h}$		
	$= 100 \text{km/h}$ Relative Distance = $80 \text{km} - 0.5 \text{h} \times 40 \text{km/h}$	B1	
	= 60km	В1	
	Time = $\frac{Dis \tan ce}{Re lative speed} = \frac{60}{100} = 0.6 hours$	В1	
	Distance from $A = 20km + 0.6 \times 40$	M 1	
	= 44km	A1	
	(ii)		
	10.30am + 36 minutes	M1	
	= 11.06am	A1	
	(b)		
	Time taken by Kamau = 11.06am - 10.20am		
	= 46 minutes	В1	
	Average Speed = $\frac{44}{46/1}$	M1	
	/60	A1	
	= 57.39km/h		
		10	
21	(a)		
<u> </u>			







121/1 Mathematics paper 1

6 of 8

21	(b) Class x f fx 1-5 3 4 12 6-10 8 8 64 11-20 15.5 8 124 21-30 25.5 6 153 31-50 40.5 40 1620 51-55 53 3 159 56-65 60.5 3 181.5 72 2313.5	B1 B1
	Mean = $\frac{\Sigma f x}{\Sigma f}$ = $\frac{2313.5}{72}$ = 32.13	M1 A1
		10
22	 (a) BAR < QAB = 100° - opposite angles in a quadrilateral add up to 180° < BAR = 80° - angles in a straight line add up to 180° (b) STR < STR = 180 - (80 + 70°) = 30 - angles in a straight line add up to 180° (c) BSU < UBS = 180 - 115° = 65° - angles in a straight line add up to 180° < BSU = 45° - angles in a straight line add 	B1 B1 B1 B1 B1 B1 B1 B1
	up to 180 ⁰	B1





(e) SBU - 180 - 115 = 65° - angles on a straight line 10 23 XY and YZ Expression of ∠ 30° Completing A XYZ (b) XZ = 4.0cm ± 0.1 (c) Bisecting any 2 sides Curve circle (d) Radius = 4.2cm ± 0.1 (e) Area of circle → 3.142 (4.2)² Area of A → ½ x 8 x 6 sin 30° Area = 55.425 - 12 Area = 55.425 - 12 M1 M1 M1 M1 A1 10		(d) BRS < SBA = 1150 – vertically opposite angles are equal < BRS = 65 – opposite angles in a cyclic quadrilateral add up to 1800	B1B 1	
23 . XY and YZ XYZ construction of $\angle 30^{\circ}$ Completing $\triangle XYZ$ (b) XZ = 4.0cm ± 0.1 (c) Bisecting any 2 sides Curve circle (d) Radius = 4.2cm ± 0.1 (e) Area of circle $\longrightarrow 3.142 (4.2)^2$ Area of $\triangle \longrightarrow \frac{1}{2} \times 8 \times 6 \sin 30^{\circ}$ Area = 55.425 - 12 $= 43.43 \text{cm}^2$ B1 B1 B1 B1 B1 B1 B1 B1 B1 B				
$XY \text{ and } YZ$ $XY \text{ and } YZ$ $XYZ \text{ construction of } \angle 30^{0}$ $Completing \Delta XYZ$ $B1$ $(e) XZ = 4.0 \text{cm} \pm 0.1$ $(e) Bisecting any 2 \text{ sides}$ $Curve circle$ $Area of a \rightarrow \frac{1}{2} \times 8 \times 6 \sin 30^{0}$ $Area = 55.425 - 12$ $= 43.43 \text{ cm}^{2}$ $B1$ $B1$ $B1$ $B1$ $B1$ $B1$ $B1$ $B1$			10	
	23	XY and YZ	B1 B1 B1 B1 B1 M1 M1 A1	

24 (a)
$$\frac{dy}{dx} = 3x^2 + 2x - 3$$
 B1
(b) $3x^2 + 2x - 3 = 0$ M1
 $x = \frac{-2 \pm \sqrt{4 + 36}}{6}$ M1
 $x = -1.3875$ or 0.7208 A1
 $\frac{d^2y}{dx^2} = 6x + 2$ M1 Testing for Max or min





