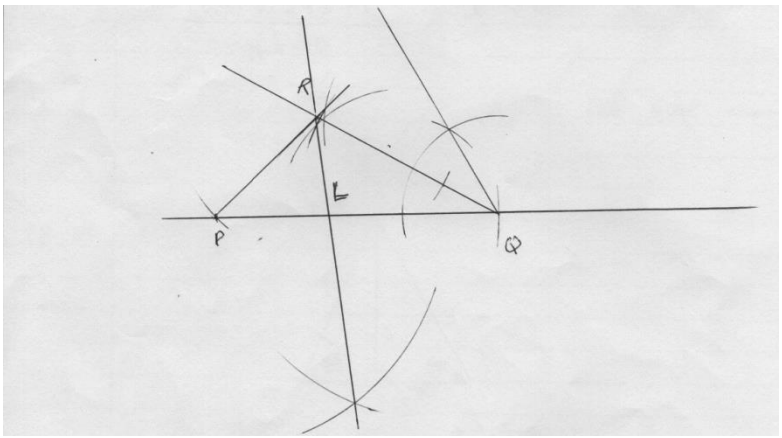
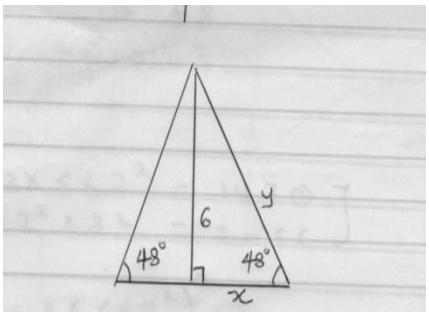
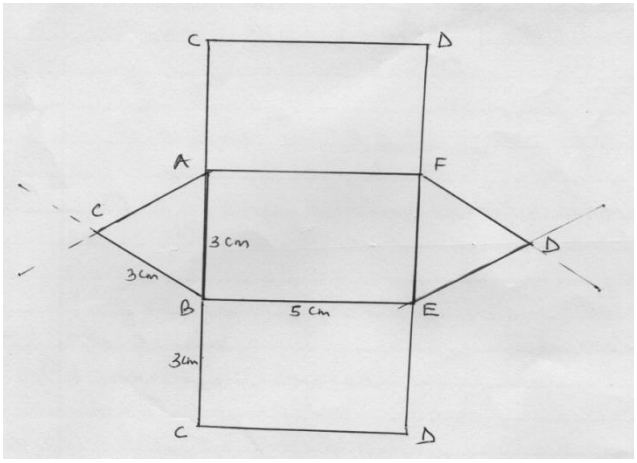
MATHS PAPER 1 MARKING SCHEME

EMBU NORTH SUB COUNTY 2018

1	$\sqrt{\frac{0.38\ x\ 0.23\ x\ 2.7\ x10^7}{0.114\ x\ 0.0575\ x\ 10^7}}$ $= \frac{38x\ 23\ x\ 27\ x100}{114\ x\ 575}$ $\sqrt{36}$ $= \pm 6$	M1 M1 A1
2	$\frac{4\ (2x-3) - \ 6(x-2) - \ 3(\ 1-x)}{12}$ $\frac{8x-12-6x+12-3+3x}{12}$ $\frac{5x-3}{12}$	M1 M1 A1
3	2.456×10^1 $0.4072 \times 10^{-1} = 0.04072$ $4.362^2 = 19.027$ 0.04072 + 19.027 = 19.06772 19.07 correct to 4 s.f	M1 M1 A1
4	5000 x 84.15 = Ksh 420750 Ksh 289000 Ksh 131750 131750 121.47 = 1084.63	M1 M1 A1

5	Esternal vol= 240 x 30 x 20 = 144000cm^3 Internal volume = 237 x 27 x 17 = 108783 cm^3 volume of wood = 144000 – 108783 = 35217 Mass = 35217 x 0.4 = 14086.8g = 14.0868 kg	M1 M1 M1 A1
6	X + ⅓x = 180^o $\frac{4}{3}x$ = 180^o $\frac{4}{3}$ x $\left(\frac{3}{4}\right)$= 180^o ($\frac{3}{4}$) X = 135^o External Angle = 180^o – 135^o = 45^o $\frac{360^0}{45^0}$ = 8 sides	M1 A1
7	2x^2 + xy – y^2 = (2x –y) (x+y) X^2 – y^2 = (x + y) (x –y) $\frac{(2x-y)(x+y)}{(x+y)(x-y)}$ = $\frac{2x-y}{x-y}$	M1 M1 A1
8	Y≤ 3 Y = -X + 3 Y ≥ -X + 3 Y > X	B1 B1 B1
9	Centre $\left(\frac{-2+4}{2}, \frac{6+-2}{2}\right)$ (1,2) M1 = $\frac{-2-6}{4--2}$ = $\frac{-8}{6}$ = $\frac{-4}{3}$ M2 = $\frac{3}{4}$ $\frac{Y-2}{X-1}$ = $\frac{3}{4}$ 4Y -8 = 3X -3 4Y = 3X + 5 Y = $\frac{3X}{4}$ + $\frac{5}{4}$	 B1 M1 A1

10		<PQRB1 <PQR B1 L B1
11	3 years ago son x Now son x + 3 Father 3x + 3 In 3 years time Son x + 3 + 3 Father 3x + 3 + 3 X + 6 + 3x + 6 = 76 4x + 12 = 76 4x =64 X = 16 Present ages Son = 16 + 3 = 19 years Fathers = 3 x 16 + 3 = 51 years	B1 M1 A1
12	$2^{3x} = 2^{4y+2}$ 2 = 2 3x – 4y = 2 ……(i) $36x = 3^{2y-6}$ 6x – 2y = -6 ……(ii) 6x – 8y = 4 $\frac{6x - 2y = -6}{-6y = 10}$ Y= $\frac{-5}{3}$ X = $\frac{-14}{9}$	M1 M1 attempting to solve A1 for both answers

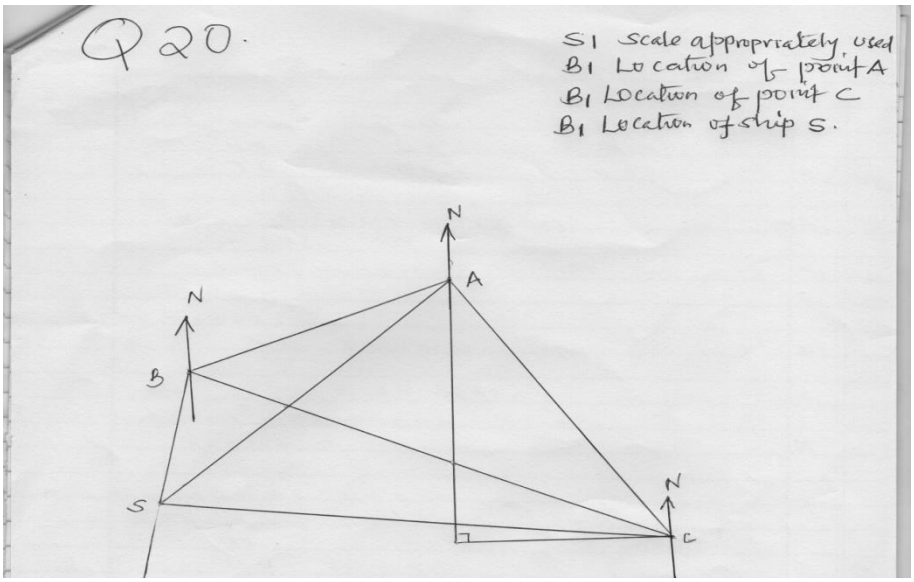
13	 Tan $48^0 = \frac{6}{x} = 5.4$ Sin $48^0 = \frac{6}{y} = 8.07$ 5.4 x 2 = 10.8 + 8.07 + 8.07 = 26.940 = 26.94 cm	M1 M1 A1
14	(5 x 3) 3+ (½ x 3^2 Sin 60 ^{o})2 45 + 3.8971 52.7942cm^2 	M1 A1 B1 for correct measurement B1 Labelled
15	P = 5 $\binom{3}{2}$ – 2 $\binom{4}{1}$ = $\binom{15}{10}$ – $\binom{8}{2}$ = $\binom{7}{8}$ P = $\sqrt{7^2 + 8^2}$	B1 M1

	= 10.63	A1
16	$2 \times 3 \times 5 \times 7^2 = 1470$ $2^4 \times 3^2 \times 7^2 = 7056$ $\frac{(2x\ 3x\ 5\ x\ 7^2)}{\sqrt{(2^4 x 3^2 x 7^2)}}$ $\frac{2^2 \times 3^2 \times 5^2}{2^2 \times 3 \times 7}$ $3 \times 5^2 \times 7^3$	M1 M1 A1
17a b C	70 Mean x = $\frac{4975}{199}$ = 25 years On the graph paper	B1 B1 A1

Age (years	x	F	xf
0 – 5	2.5	14	35
5-15	10	41	410
15 – 25	20	59	1180
25 – 45	35	70	2450
45 – 75	60	15	900
		Σf = 199	

18 a i)	kisumu ——————————— Nairobi 9.30a.m 10.00 Bus 81km/hr matatu 72km/hr Distance covered by bus by 10.10 $81 \times \frac{40}{60}$ = 54km Time taken for the two to meet	 M1 M1

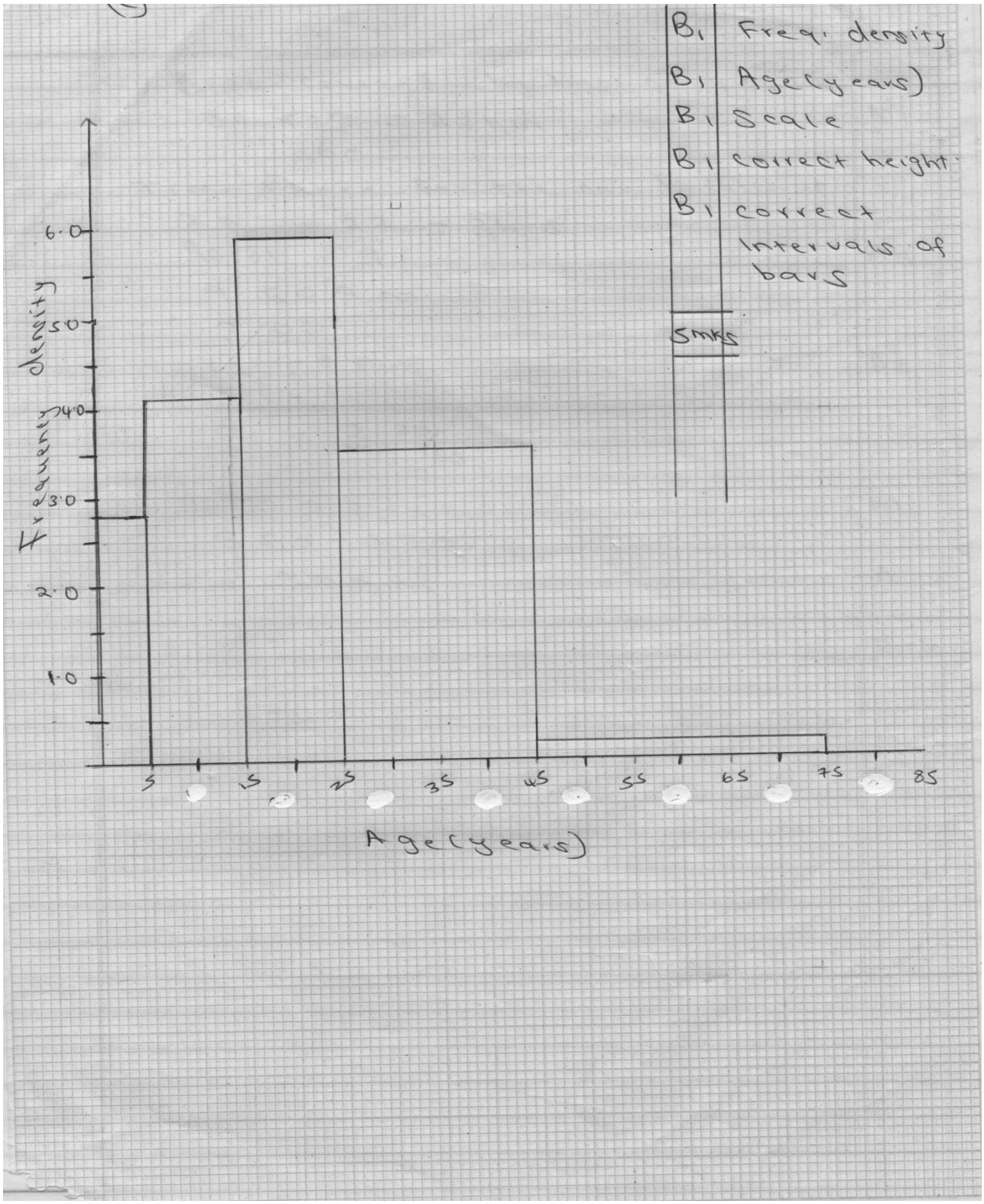
	$\frac{360-54}{(81+72)}$ 2 hrs	A1
ii		M1
	72 x $\frac{40}{60}$ = 48km Dist. By bus 40min= 54km + 48km = 102km apart	A1
b. i		M1
	Dist. covered by the bus at 9.50a.m 81 x $\frac{20}{60}$ = 27km	M1
	Time taken for the car to catch up $\frac{27}{90-81} = \frac{27}{9}$ = 3hrs	A1
	9.50a.m+3.00=12.50p.m	
ii		M1
	81 x 3 $\frac{20}{60}$	
	= 270km 360 – 270 90km	A1
19a	$\frac{8}{3} = \frac{4+x}{x}$	*B1*
	8x = 12 + 3x	*M1*
	5x = 12	*A1*
	X =2.4cm 2.4+4=6.4cm	
b.	V = $\left(\frac{1}{3}x\ \frac{22}{7}\ x\ 8^2\ x\ 6.4\right) - \left(\frac{1}{3}\ x\ \frac{22}{7}\ x\ 3^2 x\ 2.4\right)$	*M2*
	429.105 – 22.629	M1
	406.48m^3	A1
c.	V= $\frac{2}{3}\ x\ \frac{22}{7}\ x\ 27$	M1
	= 56.57cm	
	Total volume = 406.48 + 56.57	M1

	= 463.05cm^3	A1
20. a		
b		
i	AS = (10.1 $\pm$ 0.1) x 20 = 202 $\pm$ 2km	B1
ii	Bearing of S from C = 276^o $\pm 1^0$	B1
iii	B to C = (13 $\pm$ 0.1) x 20 = 260 $\pm$ 2km	
iv	Perpendicular distance of c from A = (8.5 $\pm$ 0.1) x 20 = 170 $\pm$ 2km	B1 B1
v.	Compass Bearing of S from A = S45^{o}W	B1
21.a	Tonnes dist cost 48 28 sh.24000 96 49 x X = $\frac{96}{48}$ x $\frac{49}{28}$ x 24000 = sh.84000	B1 for $\frac{49}{28}$ B1 for $\frac{96}{48}$ M1 mult A1 (CAO)
b.	Expenditure $\frac{96}{8}$ x 3000 = sh 36000 Total = 84000 – 36000	M1 A1

	Profit sh 48000	B1
c	144 – 96 = 48 tonnes Tonnes dist amount 48 28 24000 48 84 y	M1
	Y = $\frac{84}{28}$ x 24000	M1
	= sh.72000 Transport cost $\frac{100}{144}$ x 72000 Sh 50,000	A1
22a.i	$\frac{12000}{\times}$	B1
ii	$\frac{14000}{\times -5}$	B1
	$\frac{12000}{x-5}$ + 100	B1
b	$\frac{14000}{x-5}$ - $\frac{12000}{x}$ = 100	M1
	14000x – 12000x – 60000 = 100 x (x -5) X^2 – 25x – 600 = 0	M1
	X = $\frac{25+\sqrt{625+2400}}{2}$	M1
	$\frac{25 \pm 55}{2}$	A1
	X = 40	
c	$\frac{14000}{35}$= 400 $\frac{1200}{40}$ = 3000	M1 B1
	300: 400	A1

	3:4	
23	Graph paper	
24a	$S= 2 (5^3) + 4(5)^2 – 8 (5)+ 3$ $= 250 + 100 – 40 + 3$ $= 313m$	B1 A1
b.	$6t^2 + 8t – 8$ t=5 $6(5^2) + 8(5) – 8$ 150 + 40 -8 182m/s	B1 M1 A1
c.	V = 0 6t2 + 8t -8=0 2 (3t -2) (t+2) =0 $t = \frac{2}{3}$ or t = -2 $t = \frac{2}{3}$	B1 M1 A1
d	$6t^2 + 8t -8$ 12t + 8 t=2 12(2) + 8 $32m/s^2$	B1 A1

17.C


B1 Freq. density
B1 Age(years)
B1 Scale
B1 correct height
B1 correct intervals of bars
5mks
Frequency density
6.0
5.0
4.0
3.0
2.0
1.0
5
15
25
35
45
55
65
75
85
Age(years)

Q23.

(b) Centre of enlargement $B(0, 4)$ scale factor $\frac{1}{2}$ B_1

(c) $P_2(3, -5)$ $Q_2(1, -3)$
$R_2(-1, -9)$ $S_2(3, -9)$ B_1

(d) $P_3(-1, -3)$ $Q_3(-3, -1)$
$R_3(-5, -7)$ $S_3(-1, -7)$ B_1