TRIAL ONE EVALUATION TEST 2019

121/1 MATHEMATICS ALT A MARKING SCHEME

1.	$\frac{7}{4} + \frac{3}{2} \times \frac{11}{6} = \frac{7}{4} + \frac{11}{4} = \frac{18}{4}$	M1
	$\frac{3}{4} \times \frac{5}{2} \div 2 = \frac{15}{8} \times 2 = \frac{15}{4}$	M1
	$\frac{18}{4} \times \frac{4}{15} = \frac{6}{5} = 1\frac{1}{5}$	A1
2.	Rent - $\frac{1}{4}$ Food - $\frac{1}{3} \times \frac{3}{4} = \frac{1}{4}$	
	Bills - $\frac{1}{10}\{1 - \frac{1}{2}\} = \frac{1}{10} \times \frac{1}{2} = \frac{1}{20}$	M1
	Remainder - $1 - \{\frac{1}{4} + \frac{1}{4} + \frac{1}{20}\} = \frac{9}{20}$	M1
	Salary → $\frac{20}{9} \times 4500 = 10,000$	A1
3.	Distance covered by bus = $70 \times 1 = 70$km Distance covered by car = $120 \times \frac{1}{2} = 60$km.	M1
	$70 - 60 = 10$ km.	M1, A1
4.	$5s + 4t = 6160$ $3s + t = 2800$	M1
	$12s + 4t = 11200$ $5s + 4t = 6160$ $7s = 5040$ $s = 720$, $t = 640$ shirt = 720/= trouser = 640/-	M1
	$(4 \times 720) + 640 = 3520/-$	A1

5. a) $(2n-4)90 = 1080$ — M1

$2n-4 = 12$

$2n = 16$ — A1

$n = 8$

b) Octagon — B1

6. $3+7+9 = 19$

$\frac{7}{19} \rightarrow 60,000$

$\rightarrow \frac{19}{7} \times 60,000$ — M1

$= 162,857.14/-$ — A1

7. $x + y = 10$

$(10y + x) - (10x + y) = 54$

$9y - 9x = 54$

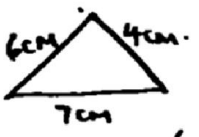
$y - x = 6$ — M1

$y - (10 - y) = 6$ — M1

$2y = 16$

$y = 8 \quad x = 2$

No. 28 — A1

8. 

$s = \frac{6+4+7}{2} = 8.5\text{cm}$

Area $= \sqrt{8.5(8.5-6)(8.5-4)(8.5-7)}$ — M1

$= 11.98\text{cm}^2$

1cm^2 rep 40000m^2

11.98 rep $11.98 \times 40,000$ — M1

$= \frac{479200}{10,000} = 47.92\text{ha}.$ — M1, A1

9.	$3.25 \times 10^{-1} \rightarrow 0.3077 \times 10^{1}$ $= 3.077$	B1
	$\sqrt{0.000125} \rightarrow \sqrt{1.25 \times 10^{-4}}$ $= 1.1180 \times 10^{-2}$ $= 0.01118$	B1
	$3.077 \times 0.01118 = 0.0344$	M1 A1
10.	$3^{2x+2} = 3^{5}$	M1
	$2x + 2 = 5$	M1
	$2x = 3$ $x = 1.5$	A1
11.	$5 \leq 3x + 2$ $3 \leq 3x$ $1 \leq x$	B1
	$3x + 2 < 14$ $3x < 12$ $x < 4$	B1
	Integral values 1, 2, 3	B1
12. a)	1 US Dollar ⇒ 75.66	
	$\frac{15132000}{75.66} =$ 20,000 US Dollars	M1 A1
b)	She 126.64 → 1 sterling Pound	
	$15,132,000 \rightarrow \frac{15,132,000}{126.64} \times 1$	M1
	= 119,488 sterling Pounds	A1

13.	$\angle ABC = 42^\circ$ (opposite angles in a cyclic quadrilateral)	B_1
	$\angle ACB = 96^\circ$ (Base angles of isosceles triangle)	$B_1 B_1$
14.	$12x^2 - 16x = 4x(3x-4)$	M_1
	$-3x^2 - 11x + 20 = -3x^2 + 4x - 15x + 20$ $= -x(3x-4) - 5(3x-4)$ $= (-x-5)(3x-4)$	M_1
	$\frac{4x(3x-4)}{(-x-5)(3x-4)} = \frac{4x}{-x-5}$ $= \frac{-4x}{x+5}$	A_1
15	$\log\left(\frac{3x+8}{8}\right) = \log(x-4)$	M_1
	$\frac{3x+8}{8} = x-4$	M_1 (Dropping logs)
	$3x + 8 = 8x - 32$ $x = 8$	A_1
16.	$\overrightarrow{PQ} = Q - P$ $= \begin{pmatrix}3\\-2\end{pmatrix} - \begin{pmatrix}2\\5\end{pmatrix} = \begin{pmatrix}1\\-7\end{pmatrix}$	M_1
	$\lvert PQ \rvert = \sqrt{1^2 + -7^2}$ $= \sqrt{50} = 7.071$	M_1 A_1

7 a) Grad $= \frac{11-7}{6-4} = 2$ — B_1

$\frac{y-7}{x-4} = 2$ — M_1

$y = 2x - 1$ — A_1

b) Midpoint $\left(\frac{6+4}{2}, \frac{11+7}{2}\right) = (5, 9)$ — B_1

$\frac{y-9}{x-5} = -\frac{1}{2}$ — M_1, B_1

$y - 9 = -\frac{1}{2}(x-5)$

$y = -\frac{1}{2}x + 11.5$ — A_1

c) $\frac{y-7}{x-4} = -\frac{1}{2}$ — M_1

$y = -\frac{1}{2}x + 9$

$-\frac{1}{2}x + 9 = -5x + 45$ — M_1

$-\frac{1}{2}x + 5x = 45 - 9$

$x = 8, \quad y = 5$

$C(8, 5)$ — A_1

18. a i) $\frac{27000}{x}$ — B_1

ii) $\frac{27000}{x+5}$ — B_1

b i) $\frac{27000}{x} - \frac{27000}{x+5} = 60$ — M_1

$\frac{27000(x+5) - 27000x}{x(x+5)} = 60$

$60x^2 + 300x - 135000 = 0$ — M_1

$x^2 + 5x - 2250 = 0$ — M_1

$(x-45)(x+50) = 0$

$x = 45$ chairs — A_1

ii) $\frac{27000}{50}$ = kshs. 540 — $M_1 A_1$

iii) $\frac{80}{100} \times 27000 = \frac{21600}{45}$ — M_1

$= 480$

$600 - 480 = 120/-$ — A_1

19 a) i) $AE = 100 \tan 30$ M1

$= 57.74$ A1

ii) $AC = \frac{57.74}{\sin 45} = 81.66$ M1

$AD^2 = 80^2 + 81.66^2 - 2 \times 80 \times 81.66 \cos 100$ M1

$AD^2 = 6400 + 6668.36 + 2268.82$

$AD = \sqrt{15,337.18}$

$= 123.8$ A1

iii) $AB = \frac{100}{\cos 30} = 115.47$ M1

$EC = \frac{57.74}{\tan 45} = 57.74$

Perimeter $= 57.74 + 100 + 80 + 123.8 + 115.47$ M1

$= 477.01$ A1

b) $616.41 - (2.8 \times 3)$

$= \frac{608.01 \times 5}{480} -$ M1

$= 6.33$

$\simeq 7$ rolls A1

20 a) Volume of Cylinder $= 3.142 \times 1.9 \times 1.9 \times 4$ M_1

$= 45.37$

Volume of cone $= \frac{1}{3} \times 3.142 \times 1.9 \times 1.9 \times 2.5$ M_1

$= 9.452$

Total $= 9.452 + 45.37$ M_1

$= 54.8\ M^3$ A_1

b) circle $= 3.142 \times 1.9 \times 1.9$ M_1

$= 11.34$

Cylinder $= 2\pi rh = 2 \times 3.142 \times 1.9 \times 4$ M_1

$= 47.7584$

Cone $= 3.142 \times 1.9 \times \sqrt{2.5^2 + 1.9^2}$ M_1

$= 18.745$

Total $= 11.34 + 47.7584 + 18.745$

$= 77.84\ M^2$ A_1

c) $h = \frac{54.82}{2.6 \times 2.6} = 8.1\ M.$ M_1, A_1

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classes	x	f	fx	cf
45-49	47	2	94	2
50-54	52	4	208	6
55-59	57	8	456	14
60-64	62	9	558	23
65-69	67	11	737	34
70-74	72	7	504	41
75-79	77	5	385	46
80-84	82	3	246	49
85-89	87	1	87	50
		$\Sigma f = 50$	$\Sigma fx = 3275$	

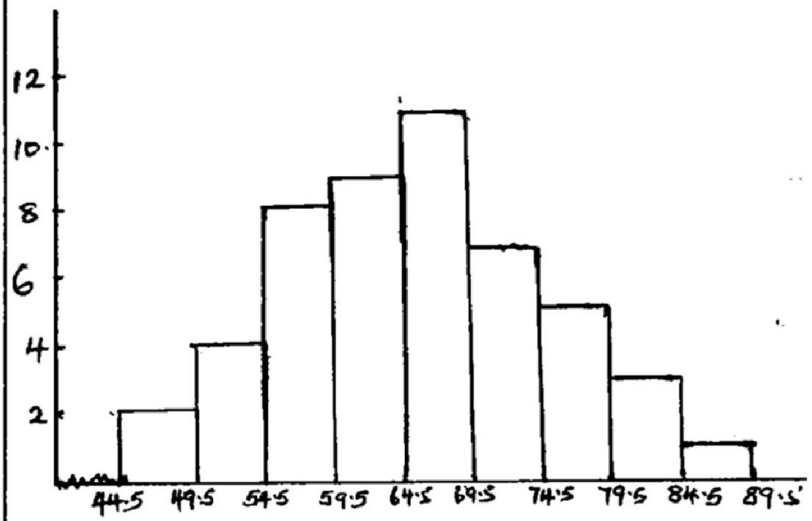
B_1 – Correct classes
B_1 – Correct frequencies
B_1 – fx column
B_1 – Cf column

$$\text{Mean} = \frac{3275}{50} \qquad M_1$$

$$= 65.5 \qquad A_1$$

$$\text{Median} = 64.5 + \left(\frac{25-23}{9}\right) \times 5 \qquad M_1$$

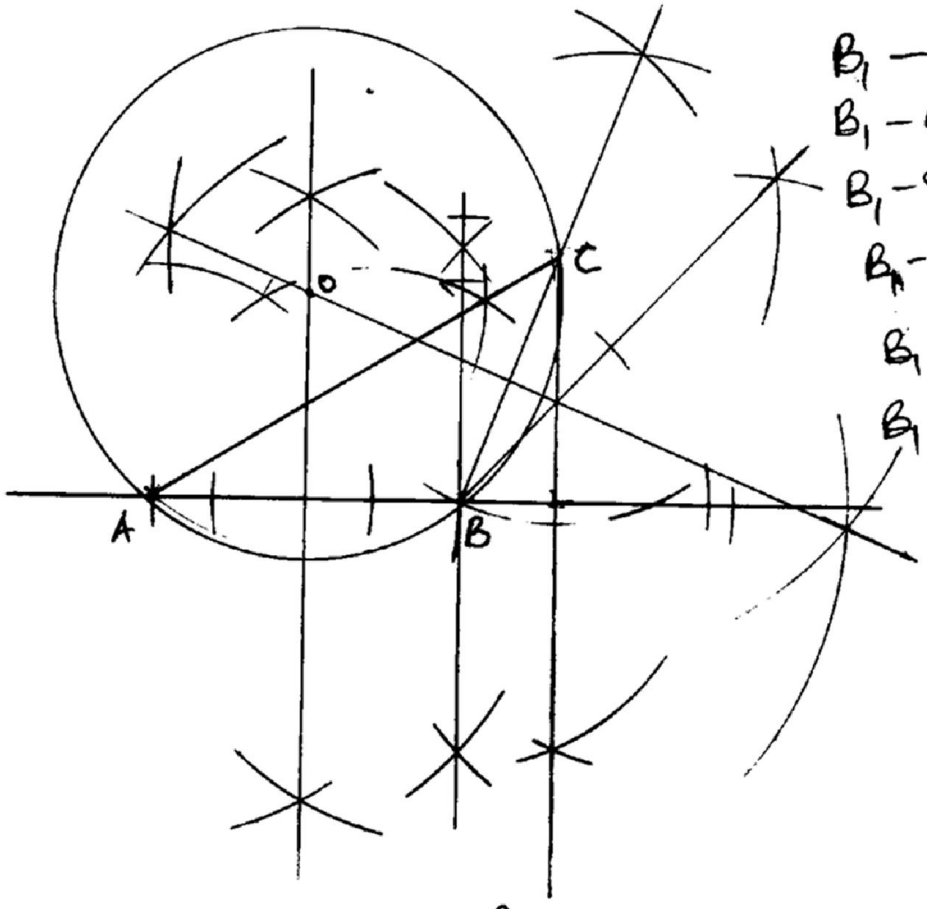
$$= 65.61 \qquad A_1$$



B_1 – correct boundaries (44.5 - 89.5

B_1 – Correct bars.

22. a)



B_1 — Angle BAC 30°
B_1 — Angle ABC 112½°
B_1 — Complete △ABC
B_1 — Locating O centre of circle
B_1 — Circle drawn
B_1 — Height drawn

Radius = 3.6 ± 0.1 cm. B_1

Height = 3.4 cm. B_1

b) ~~Area~~ of circle = $3.142 \times 3.6^2 = 40.72 cm^2$ M_1

Area of Triangle = $\frac{1}{2} \times 4.5 \times 3.4 = 7.65 cm^2$ M_1

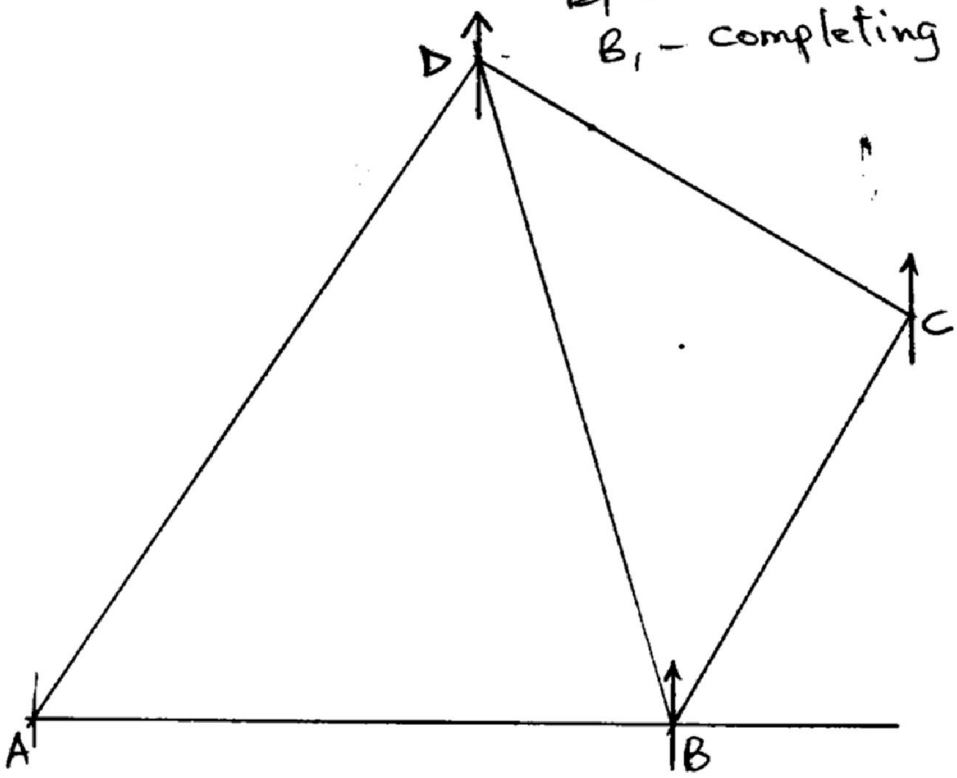
Area outside triangle = $40.72 - 7.65$

$= 33.07 cm^2$ A_1

23.

a)

B_1 – locating B
B_1 – locating C
B_1 – locating D
B_1 – completing diagram.



b) i) $180 + 36 = 216^{\circ} \pm 1$ B_1

ii) 9.3 ± 1 B_1

$9.3 \times 1 = 9.3\,KM.$ B_1

iii) Perimeter $= 9 + 6.5 + 7 + 10.9$ B_1 – Distance AD
M_1 – Addition
$= 33.4\,cm \times 1$ A_1 – Answer.
$= 33.4\,km.$

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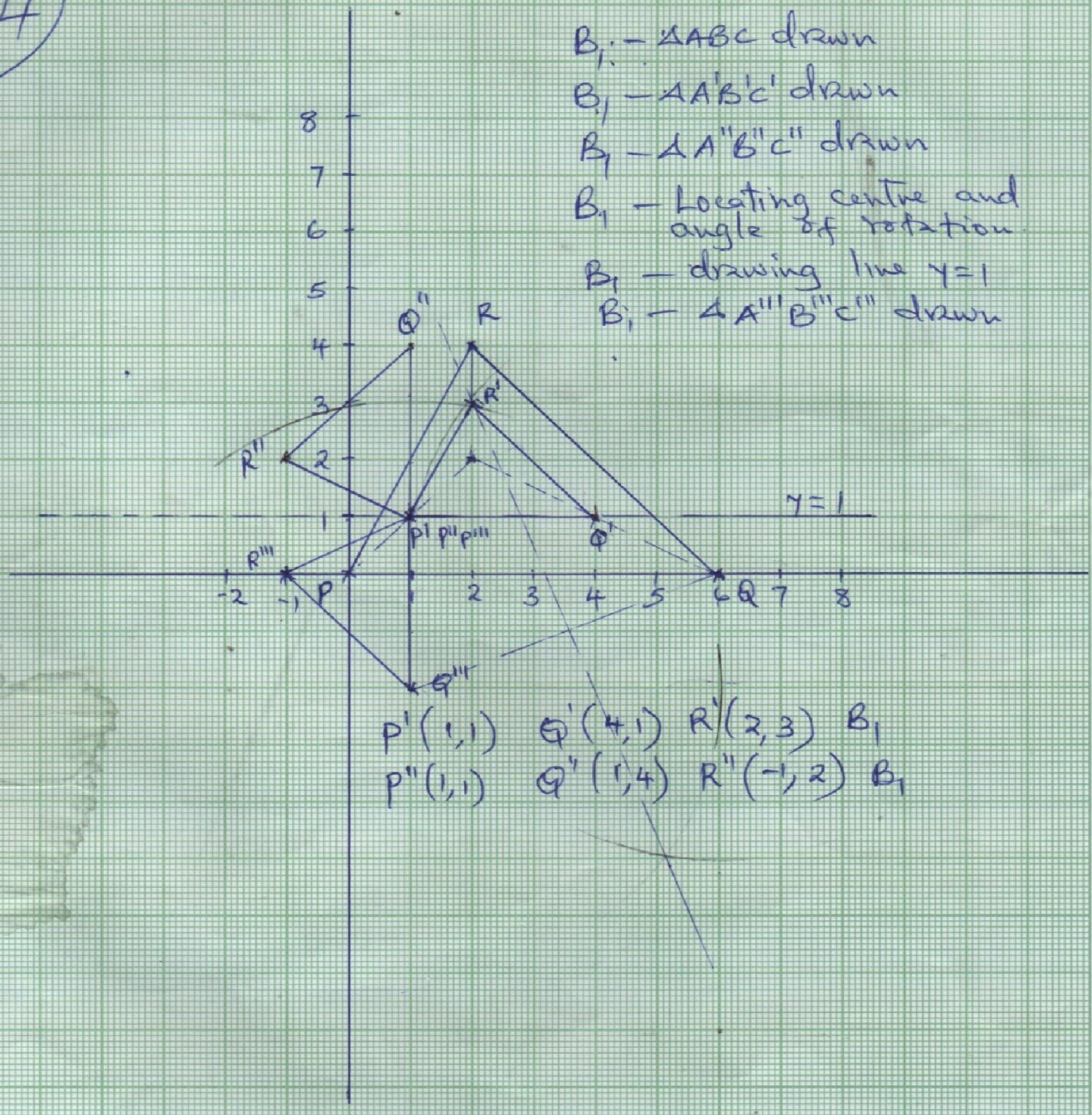

B_1 – $\triangle ABC$ drawn
B_1 – $\triangle A'B'C'$ drawn
B_1 – $\triangle A''B''C''$ drawn
B_1 – Locating centre and angle of rotation
B_1 – drawing line $y=1$
B_1 – $\triangle A'''B'''C'''$ drawn

$P'(1,1)$ $Q'(4,1)$ $R'(2,3)$ B_1
$P''(1,1)$ $Q''(1,4)$ $R''(-1,2)$ B_1