Name: ..... ..... Index No: ..... Candidate's signature..... Date.....

# Muungano KCSE Trial Exam

121/1 www.treekcsepastpapers.com **MATHEMATICS** PAPER 1 July 2017 2<sup>1</sup>/<sub>2</sub> Hours

# **INSTRUCTIONS:**

- 1. Write your Name and Index Number in the spaces provided at the top of this page.
- 2. The paper consists of two Sections Section 1 and Section I.
- 3. Answer *all* questions in Section Pand any five in Section II.
- 4. All answers and workings must be written on the question paper on the spaces provided below each question.

	Sectio	on 1	0	<u></u>												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	TOTAL
		X	0													

#### Section 11

17	18	19	20	21	22	23	24	TOTAL

## This paper consists of 14 printed Pages

Candidates should check the question paper to ensure that all the pages are printed as indicated

and no questions are missing

#### **SECTION 1** (50Mks)

Answer All questions from this section



2. A number was increased in the ratio 5:3 and the result decreased by 15%. *Find* the overall (2mks)

 $\frac{-3^{n+1}}{4\times 3^{n+2}}$ (2)
4. Solve for y in log<sub>2</sub> y =  $\log_2 3 + \log_2 7 + 2\log_2 y$ (5)  $\log_2 y = \log_2 3 + \log_2 7 + 2\log_2 y$ (6) (3mks) (3mks)

5. Five spheres of radius 2cm are melted and recast into a cone of radius 5cm. Find the height of the cone (3mks)

6. Given that  $\cos \theta = -\frac{4\sqrt{2}}{9}$  find without using mathematical tables or calculators the value of tan  $\theta$  if  $180^{\circ} \le \theta \le 360^{\circ}$  (3mks)

7. Janet was required to increase a number by 20%. By mistake, she decreased it by 20%. *By what* percentage should it be increased to give the correct value (3mks)



10. In what ratio should grade A tea costing Sh. 180 per kg be mixed with grade B tea costing Sh. 300 per kg to produce Nganomu Tea which when sold at Kshs 270 a profit of 20% is realized? (4mks)

11. ABC is an equilateral of side 6 cm. A circle centre O is drawn such that AB, AC, and BC are tangents to the circle. Calculate the exact area of triangle lying outside the circle. (3mks)

12. XY and WZ are two parallel chords of length 20cm and 16cm respectively. They are drawn on the same side of the centre of a circle. If the distance between them is 2cm, *find* the radius of the circle. (3mks)



14. A translation T maps A(4, 3) onto  $A_{I}(-4, 2)$ . Determine the coordinates of a point B that is mapped onto (-2, -2) under the same transformation (3mks) 15. A boy observes a bird on top of a post 80m away at an angle of elevation of 22°. He walks towards the post until the angle of elevation becomes 38°. *Find the distance* he covered towards the tree (correct to 1 decimal place). (4mks)

16. 10 men working 9 hours a day can complete a piece of job in 6days. 4 of them start working at 12 hours daily and go on for 5 days. They are then joined by two others but all of them now work for 10 hours daily. *How long* will it take to complete the remaining job? (3mks)

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### Answer <u>Any Five</u> questions from this section. ALL questions carry equal marks

17. (a) On the graph paper provided, *draw* triangle PQR whose vertices are P(0,12), Q(6,0) and R(12,18) (1mk)



- (ii) *Draw* triangle  $P^1Q^1R^1$  the image of triangle PQR under reflection in the line y = x*state* co-ordinates of  $P^1,Q^1$  and  $R^1$  (3mks)
- (c) The co-ordinates of triangle  $P^{11}Q^{11}R^{11}$  which is the image of triangle  $P^1Q^1R^1$  are  $P^{11}(-12,6)$ ,  $Q^{11}(-3,3)$  and  $R^{11}(-24,15)$  under transformation defined by matrix **T**, *draw* triangle  $P^{11}Q^{11}R^{11}$  hence or otherwise *find* the transformation matrix **T**. (3mks)

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18. (a) *Complete* the following table for the equation  $y = x^2 + 2x - 15$ 

(2mks)

X	-5	-4	-3	-2	-1	0	1	2	3	4	5
$y = x^2 + 2x - 15$											

(b) On the grid provided *draw* the graph  $y = x^2 + 3x + 17$  for  $-5 \le x \le 5$ . Take the scale: 2cm for 1unit on the x-axis and 1cm for 1unit on the y-axis. (3mks)





(ii) 
$$x^2-18=0$$

(1mk)

(3mks)

(1mk)

19. Complete the following table for the given functions

*	C		C							
x <sup>c</sup>	0 <sup>c</sup>	$\frac{\pi^c}{2}$	π	$\frac{3\pi^c}{2}$	$2\pi^{c}$	$\frac{5}{2}\pi^{c}$	$3\pi^{c}$	$\frac{7}{2}\pi^{c}$	$4\pi^{c}$	$\frac{9}{2}\pi^{c}$
$Sin \frac{1}{2}x^{c}$										
$3\sin\left(\frac{1}{2}x+\frac{\pi}{3}\right)^c$										
							(	$- \rangle^c$		

(a) **Draw** the graph of the functions of  $y = Sin \frac{1}{2}x^c$  and  $y = 3sin \left(\frac{1}{2}x + \frac{\pi}{3}\right)^c$  on same axes for



(2mks)

(c) (i) *State* the amplitude period and phase angle of the function  $y = 3\sin\left(\frac{1}{2}x + \frac{\pi}{3}\right)^c$  (2mks)

(ii) Use your graph to solve the equation 
$$\sin\left(\frac{1}{2}x^c + \frac{\pi}{3}\right)^c - \frac{1}{3}\sin\frac{1}{2}x^c = 0$$
 (1mk)

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Marks	$0 \le x < 10$	$10 \le x < 20$	$20 \le x < 30$	$30 \le x < 40$	$40 \le x < 50$	$50 \le x < 60$								
No of students	6	9	12	30	20	У								
Marks	Marks $60 \le x < 70$ $70 \le x < 80$													
No of students	6 6	3												
(a) <b>I</b>	Determine the	value of y				(1mk)								
(b) \$	State the modal class													
(c) <b>(</b>	Calculate the mean													
(d) <b>(</b>	Calculate the	median Past Papers	ist www.fre	3KC5EQ'a		(2mks)								

20	The table	helow	shows	the ma	rks sco	ored by	100	students	in a	mathema	atics	test
<i>2</i> 0.	The table	DCIUW	SHOWS	uic ma	113 300	ncu Uy	100	students	m a	mathema	aucs	icsi

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(e) *Calculate* the pass-mark if 45% of the students passed this exam (3mks)

21. The displacement s metres of a particle moving along a straight line after t seconds is given by:- $S = 4 - 4t + 2t^2 + t^3$ a) *Find* i) Its speed when  $t = \frac{1}{2}$ (3mks) epastpapers.com ii) its initial acceleration (2mks) b) Calculate (i) The time when the particle was momentarily at rest. nomer stpapers visit www.free ment ' (3mks) ii) Its displacement by the time it comes to rest. (2mks)

22. The positions of two towns **A** and **B** on earth's surface are  $(60^{\circ}N, 139^{\circ}E)$  and  $(60^{\circ}N, 41^{\circ}W)$  respectively. *Given that the radius of the earth is 6370km* 

a) *Find the distance* between A and B along the parallel of latitude  $60^{\circ}$ N (2mks)

b) *Calculate* the shortest distance between *A* and *B*.

(3mks)

c) Another town *C* is 420km East of town *B* and on the same latitude as *A* and *B*. *Find* the location of town *C*. (5mks)

23. A pilot intends to fly from A to D through B and C; B is 750km from A and on a bearing of  $050^{\circ}$ . C is on a bearing of  $320^{\circ}$  from B and their distance apart is 600km. D is  $265^{\circ}$  from C and at a distance of 1050 km.

a) Using the scale 1cm for 100km show the flight route. (5mks)

b) If the pilot now flies directly from D to  $A_{th}$  what direction does he fly. (1mk)

c) The plane flies at 500km/h. That leaves D at 8.00am at what time did it arrive at A. (4mks)

24. Aggrey, Beatrice and Chebet wanted to start a business. They contributed Sh. 135,000, Sh 216,000 and Sh. 270,000 respectively. They agreed to share annually half of the proceeds from the business in the ratio of their contributions.

- a) *Determine* the ratio of their contributions (1mk)
- b) After one year the business yielded Sh. 1,035,000. *Find* each person's share (3mks)
- c) At the beginning of the second year, Aggrey boosted his shares by the profit he had received for the first year. The other two also increased their shares in the ratio of 5:3 each. *Find* the new ratio of their shares (3mks)
- d) If they still shares half of the profit in the ratio of their shares and Aggrey got Sh. 350,000 in a certain year, *find* the amount of profit made in that year. (3mks)