ALLIANCE HIGH SCHOOL

MATHEMATICS EXAMINATION

FORM 2 END OF TERM ONE 2016

TIME: 2½HOURS

NAME..

CLASS ....   ADM. NO................

1.   Evaluate: $\dfrac{\frac{1}{2} \text{ of } 3\frac{1}{2} + 1\frac{1}{2}\left(2\frac{1}{2} - \frac{2}{3}\right)}{\frac{3}{4} \text{ of } 2\frac{1}{2} \div \frac{1}{2}}$ (3 marks)

2.   Without using a calculator or mathematical tables simplify.   (3 Marks)

$$\sqrt{\frac{0.504 \times 14.3 \times 910}{0.28 \times 1.17 \times 28.6 \times 7}}$$

3.   Find the value of x if   (3 Marks)

$$\left(\frac{27}{8}\right)^{x+7} = \left(\frac{4}{9}\right)^{-3x}$$

4. Express 1.441441............ in the form p/q where p and q are integers. (q # o)
   (3marks)

5. Solve the simultaneous equations $\frac{1}{y} = \frac{2}{x} + \frac{1}{10}$ and $\frac{3}{4y} + \frac{5}{2x} = \frac{7}{8}$ (3 marks)

6. Thirty two men working at the rate of 9hrs a day can complete a piece of work in 7 days. How many more men working at the rate of 8hrs a day would complete the same work in 6 days?   (3 marks)

(3 marks)

7. Evaluate: $\frac{44 \ - \ - \ 28}{12 \ \times \ - \ 2} - \frac{8^2 \ \times \ - 12 \ - \ 24}{96 \ \div \ - \ 12 \ \times \ 9}$

8. The mass of two similar solid are 324g and 768g. Find
   (a) height of the smaller solid if the height of the bigger solid is 20cm. (2 marks)
   (b) the surface area of the smaller solid if the surface area of the bigger solid is 40cm².
      (2 marks)

9. Reduce the following expression onto a single fraction.
      (3 marks)
   $$\frac{4x - 5}{2} - \frac{2x - 1}{6}$$

10. From the roof of a house, a boy can see an avocado tree which is 20m away from the house. He measures the angle of elevation of the top of the tree as 21° and the angle of depression of the bottom of tree as 31°. Find the height of the avocado tree.(3 marks)

11. Line L_1 passes through the points A (1, -2) and B(3, -4). Find the equation of the line L_2 passing through the mid-point of AB and perpendicular to L_1, leaving your answer in the form ax + by + c = 0. (3mks)

12. A Kenyan bank buys and sells foreign currencies at the exchange rates shown below.

	Buying (KShs.)	Selling (KShs.)
1 Uuro	147.86	148.00
1 US Dollar	74.22	74.50

An American arrived in Kenya with 20 000 Euros. He converted all the Euros to Kenya shillings at the bank. He spent KShs. 2,512,000 while in Kenya and converted the remaining Kenya shillings into US Dollars at the bank. Find the amount in Dollars that he received.

(3 Marks)

13. In June, Kioko donated $1/6^{th}$ of his salary to a children's' home while Mutethya donated $1/5^{th}$ of her salary to the same children's home. Their total donation for June was Kshs. 14,820. In July Kioko donated $1/8^{th}$ of his salary to the children's home. Their total donation for July was Kshs. 8,675. Calculate Kioko's monthly salary   (4marks)

14. Given that $cos(x - 20)^0 = Sin(2x + 32)^0$ and x is an acute angle. Find tan (x-4)

(3 marks)

15. Use reciprocal and square tables to evaluate, to 4 significant figures, the expression.
(3 Marks)

$$\frac{1}{0.3654} - 4.151^2$$

16. Angle of 1.8^0 at the centre of a circle subtends an arc off 46.38cm. Find the area of the arc encloses and the radius.

(3 marks)

SECTION II (50 MARKS)

Answer ALL the questions in this section in the spaces provided.

17. Every Sunday Kiprotich drives a distance of 80km on a bearing of 074^0 to pick up her sister Njeri to go to church. The church is 75km from Njeri's home on bearing of $S50^0E$. After church they drive a distance of 100km on a bearing of 260^0 to check on their friend Akoth before Kiprotich drives to Njeri's home to drop her off then proceed to his house.

(a) Using a scale of 1cm to represent 10km, show the relative positions of these places. (4marks)

(b) Use your diagram to determine:

(i)   The true bearing of Kiprotich's home from Akoth's house.   (1mark)

(ii)   The compass bearing of the Akoth's home from Njeri's home.   (1mark)

(c) (i) The distance between Njeri's home and Akoth's home.   (2marks)

(ii) The total distance Kiprotich travel every Sunday.   (2marks)

18. The vertices of triangle PQR are P(0,0), Q(6,0) and R(2,4).

(a) Draw triangle PQR on the grid provided. (1mark)

(b) Triangle P'Q'R' is the image of a triangle PQR under an enlargement scale factor, ½ and centre (2,2). Write down the co-ordinates of triangle P'Q'R' and plot on the same grid. (2marks)

(c) Draw triangle P"Q"R" the image of triangle P'Q'R' under a positive quarter turn, about points (1,1) (3marks)

(d) Draw triangle P'''Q'''R''' the image of triangle P"Q"R" under reflection in the line $y = 1$. (2marks)

(e) Describe fully a single transformation that maps triangle P'''Q'''R''' onto P'Q'R'. (2marks)

19. A sales man is paid a commission of 2% on goods worth over kshs 100,000. He is also paid a monthly salary of Kshs 12000. In certain month, he sold 360 handbags at Kshs 500 each.

(a) Calculate the salesman's earnings that month.   (3 marks)

(b) The following month, the salesman's monthly salary was increased by 10%. His total earnings that month was shs 17600 Calculate:

(i) The total amount of money received from the sales of handbags that month. (5 marks)

(ii) The total number of handbags sold that month.   (2 marks)

20. Using a ruler and pair of compasses only,
    (a) Construct triangle ABC such that AB = 6.3cm, BC = 7.2cm and angle ABC = 60^0.
                    (3 Marks)

    (b) Measure the length AC.   (1 Mark)

    (c) Draw a circle that touches the vertices A, B and C.   (3 Marks)
    (d) Measure the radius of the circle.   (1 Mark)

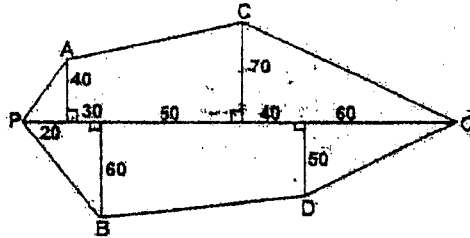   (e) Calculate the area of the triangle.   (2 Marks)

21. The figure below shows the sketch of a tea farm. The measurements are in metres.
a) Fill the information given in a field book. Take PQ as the base line, 200m long.
   (3 marks)

b) Calculate the area of the tea farm in hectares

(3marks)

c) Using logarithms tables only, evaluate.

(4 Marks)

$$\frac{16.49^2 \times \sqrt{0.6318}}{327.5}$$