GATITU SECONDARY SCHOOL PO BOX 327 GATUNDU.

FORM 4 MATHEMATICS MID-TERM EXAM. TIME 2 HRS

NAME----------ADM----------

1 Without using logarithm tables or calculators evaluate,

$$\frac{64^{-1/2} \times 27000^{2/3}}{2^{-4} \times 3^{0} \times 5^{2}}$$

(3mks)

2 Simplify the expression $\frac{12x^2 + ax - 6a^2}{9x^2 - 4a^2}$

(3mks)

3 Obtain the first four terms of the expression $(1 + x/12)^6$ in ascending powers of x (3mks)

(b)Use your expansion to evaluate $(5/4)^6$

(3mks)

4 Three partners' kamau, Mary and john decide to start a business together. If kamau contributed ksh 20,000 for 9 months, Mary contributed 25,000 for 6 months and john contributed ksh 35,000 for 4 months. Find their share in profits of khs 1,310,000. (3mks)

5Three taps P Q &R can fill a water tank in 30 minutes, 25 minutes and 15 minutes respectively. If the three taps are turned on for 5 minutes then P & R are closed, how long it would take before the tank is full. (3mks)

6 Find the center and the radius of each of the following circles.

(a) $X^2+y^2+10x+18y-38=0$ (4mks)

(b) $X^2+y^2-26y+14x=38$ (4mks)

7 What ratio by volume must a liquid weighing 0.9kg/liter be mixed with a liquid weighing 0.7kg/liter in order to make a mixture weighing 0.75kg/liter. (3mks)

8 Triangle P Q R is mapped onto $P^1 Q^1 R^1$ by a transformation matrix $N\begin{pmatrix} 3 & 1 \\ -1 & 1 \end{pmatrix}$ if the area of triangle P Q R $=16cm^2$. Determine the area of $P^1 Q^1 R^1$ (3mks)

9 Jane, Mary and peter are playing darts. The probability of Jane hitting the target is 2/5, that of Mary hitting the target is ¼ and that of peter hitting the target is 3/7. Find the probability that in one attempt;

(a) Only one hits the target.

(4mks)

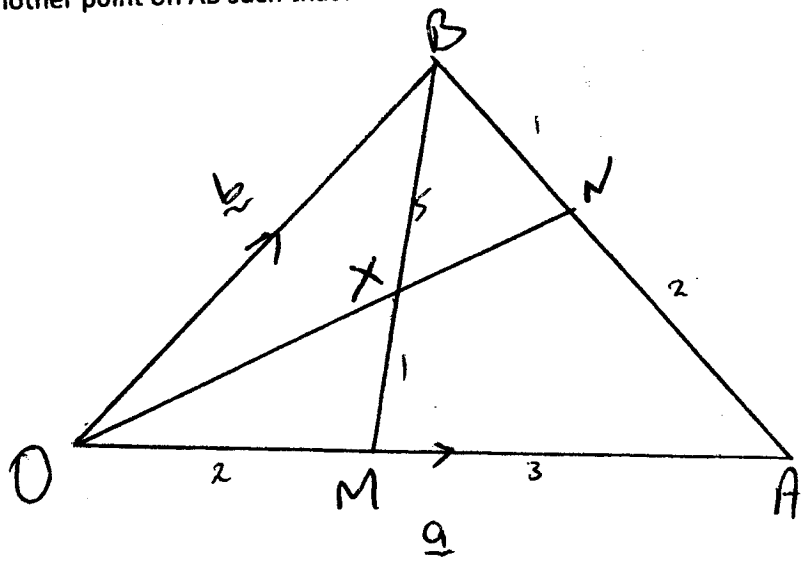
(b) All the three hit the target. (2mks)

(c) None of them hits the target (2mks)

(d) Two hit the target (2mks)

(e) At least one hit the target (2mks)

10 In the figure below O A B is a triangle in which OA=a OB= b. M is a point on OA such that OM: MA=2:3 and N is another point on AB such that AN:NB=1:2. Lines ON and BM intersect at X.



4

Xpress in terms of a and b vectors.

(a) AB.

(b) ON.

(c) BM. (3mks)

IF OX=KON and BX=HBm express OX in two ways using constants k and h. Hence find the constants k and h. (5mks)

(C)What is the ratio MX:XB. (2mks)

11 A quadrilateral has vertices at A (1,1) B (4,1) C(2,3) and D (2,2).Show on a diagram the images (3) of the quadrilateral under the combined transformationT Q^2 given that

$$T\begin{pmatrix}2\\2\end{pmatrix} Q\begin{pmatrix}0 & -1\\1 & 0\end{pmatrix}$$

(10mks)

13 The voltage (V) between the plates of a charging condenser in a given time (t) is believed to obey a law of the form $V=Ak^t$ where A and K are constants. The table below shows various values of voltage and time.

T	0.4	0.8	1.2	1.6	2.0	2.4
V	48.8	65.0	72.8	89.0	108.8	132.8

(a) Draw a linear graph to verify the law. (5mks)

(b) Find A from your graph. (3mks)

(c) Find k from your graph. (2mks)