GATITU SCONDARY SCHOOL P.O. BOX 327 GATUNDU

P1

FORM 3 MATHEMATICS END OF YEAR EXAMINATION. 2014

Attempt all questions in this paper.

1. Evaluate $\sqrt[4]{\dfrac{3.45 + 2.62}{786 \times 0.0007}}$ (3mks)

2. If $\underset{\sim}{a} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$ $\underset{\sim}{b} = \begin{pmatrix} 4 \\ 5 \end{pmatrix}$ Find

   i) $2\underset{\sim}{a} + 1/2\underset{\sim}{b}$ (2mks)

   ii) $7/8\,(3\underset{\sim}{a} + 1/4\underset{\sim}{b})$ (2mks)

3. Write down the equation of line whose gradient is -1/2 and passes through the point (3,2) (3mks)

4. The volume of right pyramid with a square base is $256cm^3$. ITS HEIGHT IS 16CM. Calculate
   a) The base area (1mk)

   b) The side of the square base (1mk)

5. The vertices of a quadrilateral are A(5,1) b(4,4) c(1,5) AND d(2,2, use the gradients to show that

i) AB is parallel to CD (2MKS)

ii) AC is perpendicular to DB (2mks)

6. Find the acute angle between the line whose equation is $4y = 12x + 9$ and the x-axis. (2mks)

7. Give that $3^{5x-2y} = 243$ and $2^{2x-y} = 2$, Calculate the value of x and y (3mks)

8. Find y if $\log_2 y - 2 = \log_2 92$ (3mks)

9. Evaluate without using tables (3mks)

$$\sqrt[3]{\frac{0.729 \times 409.6}{0.1728}}$$

10. Two perpendicular lines intersect at (3,9) If one of them passes through (2,9 1/3), Find the equation of the two lines. (3mks)

11. A triangle whose vertices are p(22) Q (4,2) and R(4,4) is mapped onto a triangle whose vertices are $p^1(4,-2)$ $Q^1(2,-2)$ and $R^1(2,-4)$ under a rotation.
    a) Find the centre and angle of rotation. (2mks)

    b) The image of points (0,4) and (-1,2) under the same rotation (2mks)

12. Make n the subject of the equation. (3mks)

$$\frac{r}{p} = \frac{m}{\sqrt{n-1}}$$

13. Given that $p = 2\underset{\sim}{i} - 3\underset{\sim}{J} + \underset{\sim}{K}$, $Q = 3\underset{\sim}{i} - 4\underset{\sim}{j} - 3\underset{\sim}{k}$ and $R = 3\underset{\sim}{p} + 2\underset{\sim}{Q}$, Find the magnitude of R to 2 significant figures (3mks)

14. Construct a circle centre x and radius 2.5 cm. Construct a tangent from a point p, 6cm from x to touch the circle at R. Measure the length PR. (4mks)

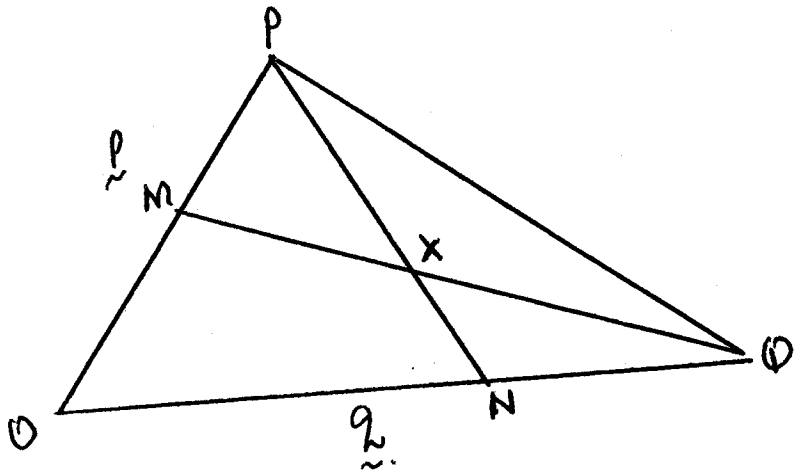
15. a) Expand $(1 + x)^7$ up to the 4^{th} term (1mk)

b)Use the above expansion into find the approximate value of $(0.94)^7$ (2mks)

16. Three quantifies P, Q and R are such that P varies directly as Q and inversely as the squire root of R. When P = 8, Q= 10 and R = 16. Determine the equation connecting P Q and R (3mks)

SECTION B. Attempt all questions in this section.

17. In triangle OPQ below OP = P , OQ = Q. Point M lies on OP such that OM: MP = 2:3 AND POINT n LIES ON OQ such that ON : NQ = 5:1 line PN intersect line MQ at X.



A) Express in terms of P and q

i) PN (1mk)

ii) QM (1 mk)

b)Given that PX = KPN and QX =rQM, where K and r are Scalars.

i)Write two different expressions for OX in terms P,q k and r (2mks)

ii)find the value of K and r (4mks)

iii)Determine the ratio in which X divides line MQ (2mk)

18. A box contain 3 brown, 9 pink and 15 white balls. The balls are identical except for the colour.
a)Find the probability of picking
I)a brown ball (1mk

ii)a pink a white ball (2mks

b)Three balls are picked at random one at a time without replacement. Find the probability that
i)two white balls and a brown ball are picked. (3mks

ii)All the three balls picked are b of the same colour. (4mks

19.Construct the parallegram ABCD where AB = 8cm BC = 6cm and angle ABC = 120o using a pair of compass and a ruler only. (3mks

a)Draw in the diagram the diagonals and construct the circumcircle to triangle ABD. (2mks

c) Construct the altitude of triangle ABD from D meeting diagonal AC at X (2mks

c)Construct altitude of triangle BCD from B meeting AC at Y (2mks

d)Measure XY (2mks

20.Income tax is charged on annual income at the rate shown below.

Taxable annual income			Tax rate kshs per
1	-	4512	2
4513	-	9024	3
9025	-	13 536	4
13537	-	18 048	5
18 048	-	22 560	6
Over	22 560		6.5

After a personal relief of 1056 per month Kamaru paid tax amounting to shs 18 152 that year.

a)How much tax would Kamaru have paid that year if he did not get the personal relief. (2mks

b)Find Kamaru's taxable income in K per year. (5mks

c)If Kamaru receives allowances amounting to 20% the taxable income, calculate his monthly basic salary in kshs. (3mks

21.The table below shows the age groups and number of people who have contracted Malaria in a certain village since 1999.

Age			No of People
10	-	19	12
20	-	29	15
30	-	39	16
40	-	49	25
50	-	59	18
60	-	69	10
70	-	79	4

A(i)State the modal age group (1mk

ii)State the median class (1mk

b)Using calculation estimate the median age group. (4mks

c)Calculate the mean age for Malaria pandemic victims. (4mks

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