

GATITU SECONDARY SCHOOL, P.O. BOX 327 – 01030, GATUNDU.

FORM 3 MATHEMATICS MID TERM EXAMINATION. TERM 3 2015.

1. Given that $T = 2\pi\sqrt{\frac{L}{g}}$

a) Make L the subject. (2mks)

b) Find L when T = 20 seconds and $g = 10 \text{ m/s}^2$ (2mks)

2. Given that $y = 10X^n$
Make n the subject (3mks)

3. If A varies directly as B^2 , how is A affected when B is halved. (3mks)

4. Given that 'y' varies inversely as X, and that when $y = 6$, $X = 44$. Find
a) The equation connecting X and Y. (3mks)

b) 'y' when $X = 5$

(2mks

5. A variable P is partly constant and partly varies as q . When $q = 3$, $P = 1$ and when $q = 4$, $P = 10$. (a) Find the equation connecting P and q . (3mks

b) Find P when $q = 6$

(2mks

6. Given that ' A ' varies directly as B and inversely as square root of C . Find the percentage change in A when B is decreased by 10% and C increased by 21%. (4mks

7. The first term of an arithmetic sequence is 4 and the last term 64. If the common difference is 5, Find the number of terms. (3mks)

8. The ratio of the 6th to the 2nd term of a geometric sequence is 256. If the 3rd term of this sequence is 32. Determine the first and the fifth terms. (3mks)

9. The 2nd, 4th and 7th terms of an AP are the first 3 consecutive terms of a G.P. Find a) the common ratio. IF the Common difference OF AP IS 2. (3mks)

- b) The sum of the first eight terms of the G.P. If the common difference of the A.P. is 2
(3mks)

- 10a) State the 6th and 10th terms of the sequence -7, -4, -1, 2 (3mks)

- b) In the geometric sequence below, indicate the 8th term.
27, 9, 3 (3mks)

11. If $\vec{a} = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$ $\vec{b} = \begin{pmatrix} -2 \\ 8 \\ 10 \end{pmatrix}$ $\vec{c} = \begin{pmatrix} 2 \\ 1 \\ 0 \end{pmatrix}$

i) Find $\vec{a} + \vec{b} - \vec{c}$ (2mks)

SECTION II

ATTEMPT ANY FOUR QUESTIONS

17 The table below shows income tax rates for a certain year.

Monthly income in Kenya shillings (Ksh)	Tax rate in each shilling
0 – 10164	10%
10165 – 19740	15%
19741 – 29316	20%
29317 – 38892	25%
over 38892	30%

A tax relief of Ksh 1162 per month was allowed. In a certain month, of that year, an employee's taxable income in the fifth band was Ksh 2108.

(a) Calculate:

(i) the employee's total taxable income in that month; (2 marks)

(ii) the tax payable by the employee in that month. (5 marks)

(b) The employee's income included a house allowance of Ksh 15 000 per month. The employee contributed 5% of the basic salary to a co-operative society. Calculate the employees net pay for that month. (3 marks)

18 (a)

Given that $y = 7 + 3x - x^2$, complete the table below.

(2mks)

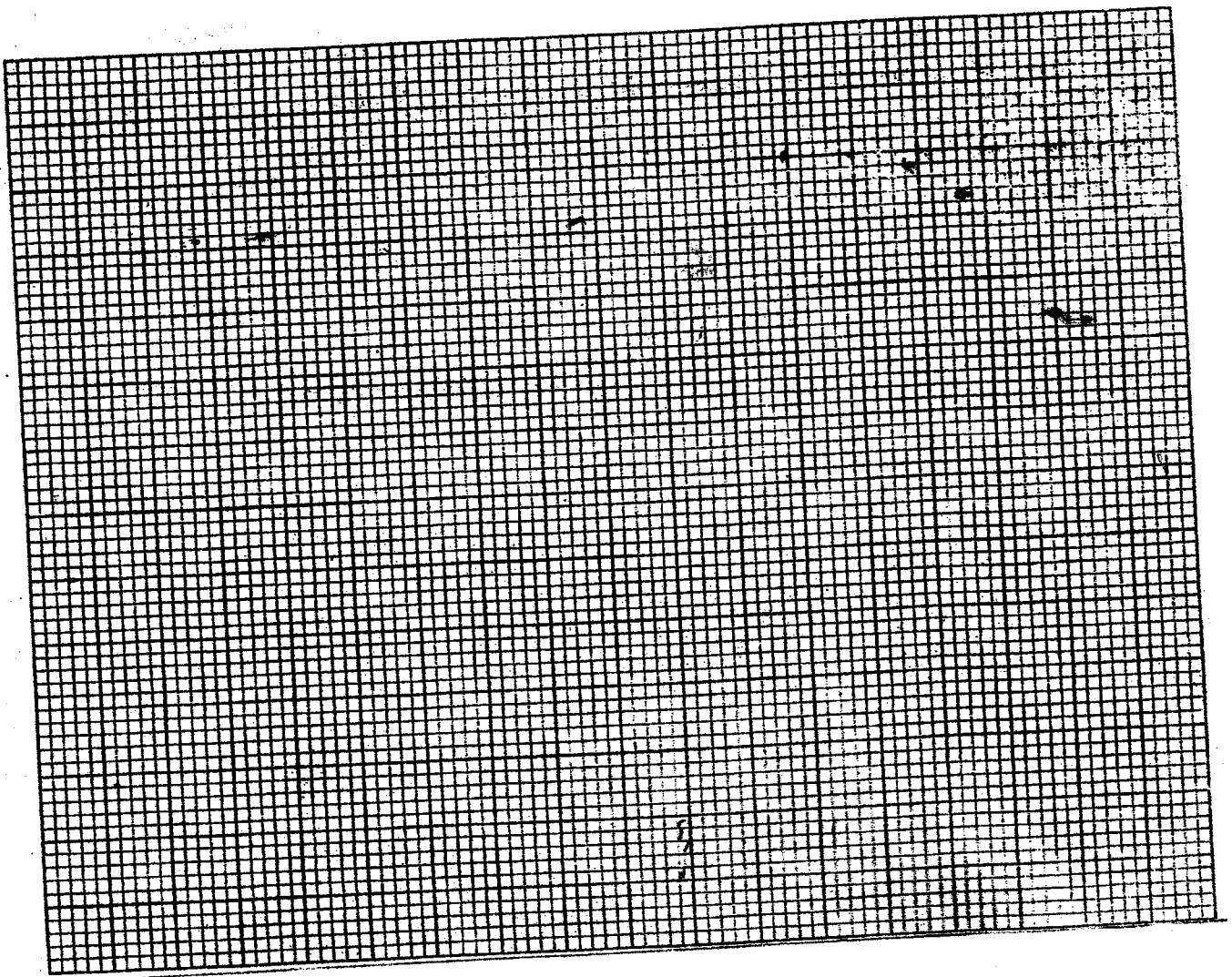
x	-3	-2	-1	0	1	2	3	4	5	6
y	-11			7						-11

(b)

On the grid provided and using a suitable scale draw the graph of

(2mks)

$$y = 7 + 3x - x^2$$



Q 1st Using a pair of compasses and ruler only;

a) Construct triangle ABC such that $AB = 8\text{cm}$, $BC = 6\text{cm}$ and angle $ABC = 30^\circ$
(3mks)

b) Measure the length of AC (1mk)

c) Draw a circle that touches the vertices A, B and C (2mks)

d) Measure the radius of the circle (1mk)

e) Hence or otherwise, calculate the area of the circle outside triangle (3mks)

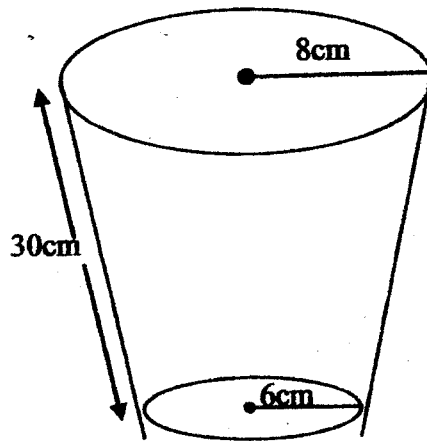
Q. 20 A matatu left Oyugis for Homabay town 51km away at an average speed of 48km/h at 7.00am. At 7.30am a Boda boda left Homabay for Oyugis travelling along the same route at an average speed of 60km/h

(a) The time when Boda boda meet the matatu (3mks)

(b) How far from Oyugis did the Boda boda meet the matatu (3mks)

(c) After meeting the Boda boda the matatu stopped for fifteen minutes before resuming the journey. At what speed should it travel then to reach Homabay at the same time when the Boda b reached Oyugis (4mks)

21. A pail is in the shape of a container frustum with base radius 6cm and top radius 8cm. The slant height of the pail is 30cm as shown below. The pail is full of water.



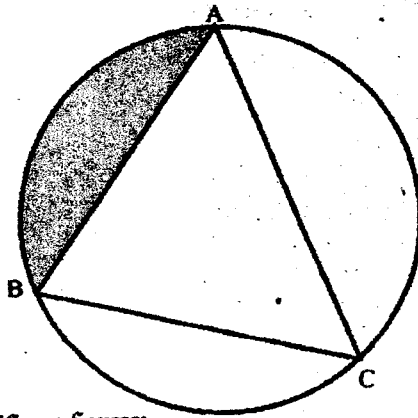
- (a) Calculate the volume of water.

(6mks)

- (b) All the water is poured into a cylindrical container of circular radius 7cm, if the cylinder has the height of 35cm, calculate the surface area of the cylinder which is not in contact with water.

(4mks)

Q 22. The diagram below shows a circle ABC with $AB=12\text{cm}$, $BC=15\text{cm}$, and $AC=14\text{cm}$



: to 4 significant figures:

Calculate to 4 significant figures:

(a) The angle ACB

(3mks)

(b) The radius of the circle

(3mks)

(c) The area of the shaded region

(4mks)

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