HOME PACKAGE
FOR ORDINARY LEVEL BASIC MATHEMATICS
FORM THREE
SET No. 01

SECTION A (60)

Answer **ALL** question from this section

1. (a) In a certain school, the English club meet after every 2 weeks, the Mathematics club meet after every 3 weeks and the Science club meet after every 4 weeks. If all three clubs met on the first week of the term, on which week will they meet together

(b) If $m = 0.2\dot{7}$ and $n = 0.1\dot{5}$, find the fraction $\frac{n}{m}$ in its simplest form.

2. (a) Evaluate $log_{10} 40,500$ given that $log_{10} 2 = 0.3010, log_{10} 3 = 0.4771$ and $log_{10} 5 = 0.6990$.

(b) Find the values of x and y if $\frac{3^{x+2}}{5^{2y-8}} = 2025$.

3. (a) U is the set of all cars, R is the set of all red cars and F is the set of all cars with four doors. Show on a Venn diagram the set of all red cars which do not have four doors.

(b) In a village everyone speaks either kiswahili or kichagga or both. If 89% speak Kiswahili and 65% speak kichagga, what percentage speak both languages?

4. Draw the graph of $y = 3x - 4$ for values of x from $-3 \, to + 3$. Read off

(a) The value of y when $x = 2.5$,

(b) The value of x when $y = -2$,

(c) The coordinates of the points where the line cuts the axes.

5. (a) (i) The diameter of a certain semi-circular slice of a watermelon is 14cm. What will be the perimeter of the slice of the watermelon? (Use $\pi = \frac{22}{7}$)

(ii) The cost of printing a pattern in a cloth is 250 Tanzanian shillings per square metres. Find the cost of printing a right triangular piece of cloth whose base is 30m and its hypotenuse is 50m.

(b) Prove the following postulates

(i) Sum of interior angles of triangle is 180°

(ii) Sum of two interior angles of triangle is equal to the exterior angle of the third interior angle.

6. (a) Three relatives shared Tshs 140,000 so that the first one got twice as much as second, and the second got twice as much as the third. How much money did the first relative get?

(b) Kitwana paid Tshs 900,000 for a desktop computer and sold it the following year for Tshs 720,000, Find

(i) the loss made

(ii) the percentage loss

7. You are required to extract balance sheet of Mr Hamisi from the following assets and liabilities on 31st December 2006 and use the transaction to find
(i) Total current assets
(ii) Total current liabilities
(iii) Working capital
(iv) Total fixed assets
(v) Quick ratio
(v) Current ratio
NB Creditors: 100,000
     Debtors : 150,000
     Bank-over draft: 50,000
     Cash in hands : 15,000
     Stock : 85000
     Furniture: 42,000
   Premises: 250,000
     Capital : 392,000

8. (a) The sum of the first two terms of a geometrical progression is 10 and the sum of the first four terms is 40. Given all terms of the progression are positive, show that:
(i) The common ratio is $\sqrt{3}$
(ii) The sum of the first n terms is $5(3^{n/2} - 1)$
(b) In an arithmetical progression, the thirteenth term is 27, and the seventh term is three times the second term. Determine the sum of the first ten terms.

9. (a) Some men using a board to slide loads from a platform onto a lorry.
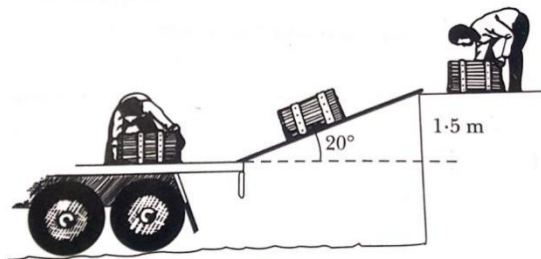
The platform is 1.5m higher than the lorry. The best position for the board is when it is inclined at 20° to the horizontal. Calculate the length of the board.
(b) A student walks 5 km due north from O and then 8.5 km due east. Find the bearing from O.

10. (a) Factorize the expression: $a^2 - b^2$. Use the result to evaluate:
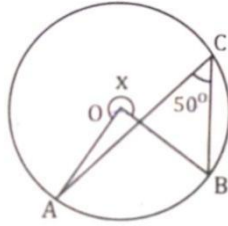$(1005)^2 - 995 \times 994$
(b) Solve the equation: $5 = 2x + y = x - y$

SECTION B (40 Marks)
Answer **ALL** questions

11. (a) Determine the value of x in the figure below where O is the centre of the circle

(b) Prove that the two tangents from an external point of a circle are equal

12. (a) Find the image of point A (3,4) after its reflection in the line $y + x = 0$ followed by another reflection in the line $y = 0$.

(b) By using the intercepts of a line $y = 2x + 5$, find the equation of the image of this line when it is reflected in the line $y - x = 0$

13. Consider the relation given by the inequality $y \leq x + 1$.

(a) Draw the graph of this relation.

(b) What is the inequality of the inverse relation?

(c) Draw the graph of the inverse relation.

14. (a) A function is defined by f(x) = $x^2 - 2$. Find

(i) The inverse $f^{-1}(x)$ of this function

(ii) The value of $f^{-1}(-2)$

(iii) The domain of $f^{-1}(x)$

(b) Re-write $|2x + 3| < 7$ without absolute value sign and hence sketch a graph of the resulting inequality

SET No. 02

1. (a) Two boys, Andrew and Aaron were to report to the headmaster's office. Andrew reported after every 30 minutes while Aaron reported after every 50 minutes. If both boys reported together at 11:45a.m, at what time will they next report together at the same time.

    (b) In a secondary school, $\frac{5}{7}$ of the students are girls and the rest are boys. There are 600 more girls than boys. How many students are in the school altogether?

2. (a) Write two advantages of scientific notation.

    (b) The mass of a n electron in kilogram is approximately 0.000, 000, 000, 000, 000, 000, 000, 000, 000, 000911. Write the number in standard form

    (c) Solve the following equation. $3log_{3x}^{2} = 2$

3. (a) Given that n(A) = 2M, N(b) =2m + 8, n(A∩B) = 6 and n(A∩B) = 34 where A and B are sets. Find the following

    (i)   The value of m

        (b) Given set A = (a, 2, b, 3). How many subsets are in set A?

4. (a) Given the following table of values for y = mx + c as follows:-

X	-2	-1	0	1	2	3	4
y			3			0	

    (i)   Fill the table above
    (ii)   Find the equation used to fill the table above in the form of y + mx + c

5. (a) At the end of the week Mr. Juma found that 60% of boys attended the school and 40% of girls attended the school at week. If the total number of boys and girls in the school is 600 and 400 respective. How many boys and girls did not attend the school?

    (b) In part (a) above write the ratio of attendance of boys to girls in their simplest form.

6. (a) The coast of buying 200 Kenyan shillings is 6000 Ugandan shillings. How much shillings can buy 36000 Ugandan shillings?

    (b) The mass of a sphere of a certain metal is proportion to the cube of their radii. A sphere of radius 10cm has a mass 42kg. Find the radius of a r with mass 5.25kg.

7. (a) Tecla and Solom shared sh 75,000 in ratio of 7:8 respectively. How much more did Solom get than Tecla?

(b) Jamila deposited Tsh. 60,000 in NBC bank for 18 months at an interest rate of 5% per annum. How much did she have if she withdrew all her money after 18 months?

8. (a) If six (6) is added to a twice of a certain number the result is less than 4. Find the value of x

(b) The diagonal of a square is 12 cm long. What is the length of its sides?

9. (a) Write one characteristics of isosceles triangle and one characteristics of equilateral triangle.

(b)
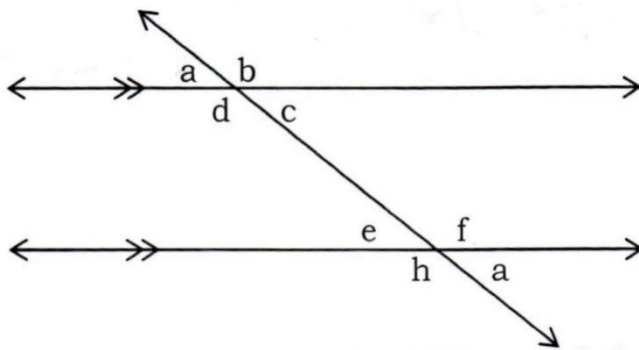
Using the figure above, what name is given to each of the following pair of angles?

(i) A and c _____

(ii) C and e _____

(iii) B and f _____

10. (a) Factorize completely$\frac{1}{x}+7x + 12$

(b) Find the numbers whose difference is 3 and the sum of their squares is 117.
(use one variable)

SECTION B (40 Marks)

Answer **ALL** questions

11. (a) The mass in kilogram of 50 students were recorded as shown in the following table.

Class interval (mass kg)	Class mark (x)	F	Deviation (d=x-A)	FD	Cumulative frequency
	42		-10	-70	
	47		-5	-40	
	52		0	0	
	57		5	50	
	62		10	40	

(i) Fill in the table in the missing columns

(ii)   Calculate mean by using assumed mean method

(iii)   Calculate the median mass (kg) of the students (leave the answer to 2 decimal places)

(b) Calculate angle PQR in the following circle 0.
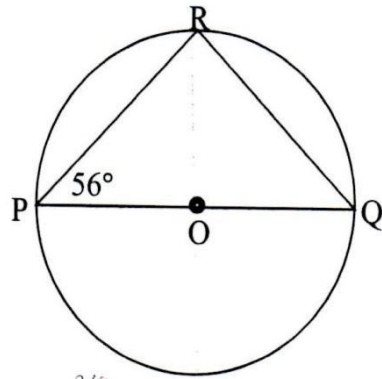
(a) Rectangle PQRS has vertical P (-3, 5), Q(-4,2), R (3,0) and S (4,3). Draw the quadrilateral and its image for the translation $(x, y) \longrightarrow (x +8, y-5)$

(b) Find the image of point Q (3, 4) reflection in the line y = 0 and followed with a translation T (-3, 2)

12. (a) Write the relation represented by the graph below
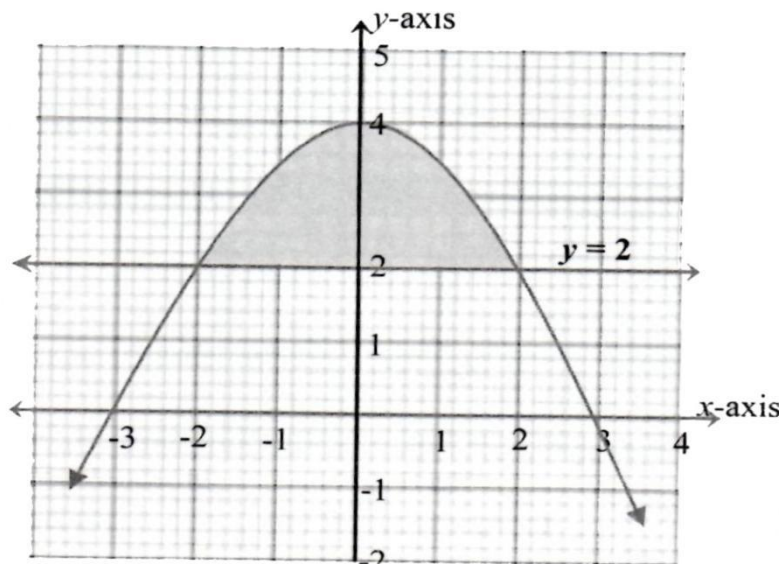
13. (a) Let f (x) be defined as follows:-

$$F(x) \begin{cases} -3 \ if \ x < 0 \\ 0 \ if \ 0 < x \leq 1 \\ 2 \ if \ x > 0 \end{cases}$$

(i)   Sketch the graph of f (x)
(ii)   State the domain and the range of f (x)

(b) The maximum value of (x) = k-4x – x² is 6. Find the value of k and the axis of symmetry of f(x)

SET No. 03

SECTION A (60 Marks)
Answer **all** questions in this section

1(a) Find y if y $= (64)^{\frac{2}{3}}$

(b) Write the following numbers in standard form correct to two significant figures

 (i) 0.000168   (ii) 0.000246   (iii) 364589

2. (a) A coil wire has a mass of 0.5kg. If a piece of wire of length 10 cm from this coil has a mass of 2.5, calculate the length of wire in the coil in cm.

(b) If the radius of spherical ball increases by 5%, what is the percentage increase in its volume?

3. Given two sets: A={$all prime numbers less than$ 20}, B= {*all odd numbers less than 30}.* Find the sets (a) A∩B. (b) A∪B.

4. (a) If points A (-3, 4), B(-3,-2) and C(1,-2) are vertices of a rectangle ABCD. Find the co-ordinates of D

(b) Given: log 2 = 0.3010 and log 3 = 0.4770. Find without using tables

(i) log 48   (ii) $\log \sqrt[3]{24}$

5. Find the measure of each interior and exterior angles of regular polygons having:

 (a) 9 sides

(b) 12 sides   (c) 15 sides

6. (a) Given that x is directly proportional to y and inversely proportional to z, if x = 5 when y=4 and z = 2. Find z when x=4 and y=5

(b) Nine workers works 8 hours a day to complete a piece of work in 52 days. How long will it take 13 workers to complete the same job by working 6 hours a day?

7. Prepare balance sheet as at 31 Dec 2003 from the following balances

Good will 5,000/=

Creditor 10,000/=

Cash at bank 6,000/=

Debtor 2,500/=

Cash in hand 1,500/=

Capital 70,000/=

Motor vehicle 25.000/=

Building 45,000/=

Net loss 5,000/=

Drawing 5,000/=

Loan from Bank 20,000/=

Closing stock 5,000/=

8.(a) Magnesium combines with oxygen in the ratio 3:2 by mass to form a new substance. What mass of magnesium would be needed to combine with 1.4 kg of oxygen?

(b) If Tsh 1250 amounts to Tsh 1525 when invested in a bank after some years at a simple interest, find rate.

9. (a) Find the length marked x, in the following figure.
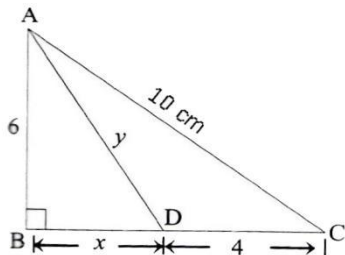
(b) The angles of elevation of two points which are 110m apart from the top of a building are 56^0 and 63^0 respectively. Find the height of the building.

10. (a) Factorize completely the expressions:

(i) $4a^2-81b^2$

(ii) $25-5x-2x^2$

(b) Make k the subject of the formula, $T = f\sqrt{\dfrac{k-d}{k}}$

11. Carefully study the frequency distribution table which shows the marks of 100 students in a physics examination

Marks	No. of Students
41-50	10
51-60	22
61-70	34
71-80	25
81-90	7
91-100	2

Calculate;

    (a) The mean given the assumed mean is 75.5,

    (b) The median in two decimal places,

    (c) The mode in two decimal places.

12. (a) If is the centre of the circle given below, find the value of x
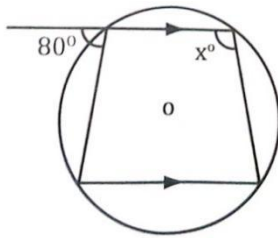
(b) Calculate the circumference of a small circle, in kilometers, along the parallel of latitude 30^0N (Leave your answer in surd form)

13. (a) Given the sequence: 3, x,y-24. Find x and y if:

(i) The sequence is arithmetic

(ii) The sequence is geometric

(b) Logs are piled up in the shape of a pyramid such that there are 60 logs at the bottom row, and each row thereafter has 2 fewer logs than the row direct below it. If at the top there are only 2 logs, find the total number of logs in the bunch

14. A function $f(x)$ is defined: $f(x) \begin{cases} x \ if \ x < -2 \\ 2x \ if -2 \leq x < 3 \\ x+1 \ if \ x \geq 3 \end{cases}$

(a) Find f (-5), f(0) and f(10)

(b) Sketch the graph of f(x)

(c) Find the domain and range of f(x)