THE UNITED REPUBLIC OF TANZANIA
THEMI HILL SECONDARY SCHOOL
100 QUESTIONS
BASIC MATHEMATICS FORM III

1. A car uses 5 litres of fuel to cover a distance of 64km. Calculate the rate of distance covered per litre
2. A pipe fills a tank of volume 3000 litres in 2 hours. At what rate does it fill the tank per minute?
3. In year 2000 the population of town was 400,000 people. If the population of town in year 2005 was 900,000 people, what was the annual rate of increase of the town's population?
4. During drought, mollel lost 81 goats in three weeks. Calculate his daily loss.
5. A dress which was originally marked at Tsh. 10, 000 was sold at 8500. Find the rate of reduction as cents in a shilling.
6. A piece of land which cost Tsh 2000,000 in year 2000 was sold at Tsh 3,100,000 in year 2005. Find the rate of increase
   a) Per year (b) a cents in shilling
7. A container which initially had 4 litres of milk now has 3.5 litres due to leaking. Find the rate of leaking of milk as millilitres in alitre.
8. A typist can type 1000 works in 8 minutes. What is her speed?
9. In a office 15 telephone calls are received in 2 hours. At what rate are telephone calls received per minute?
10. Thirty – five trees are cut down in a forest every week. At what rate are trees in the forest cut per day?
11. Given that A varies directly as B and A = 9 when B=5, Find:
    a) The constant of proportionality
    b) An equation that relates A and B
    c) A when B = 7.5
    d) B when A = 0.5

12. If $y \propto \sqrt{x}$ and y = 4 when x = $^4/_9$ find
    a) The constant of proportionality
    b) An equation that relate y with x
    c) y when x = ¼
    d) x when y = ⅓

13. Given that $y \propto x$
    a) Copy and complete the table below

x	1	2	3	4
y		7		

    b) Find the constant of proportionality
    c) Find the equation relating y to x

14. The variable V and U are such that $V \propto \sqrt{U}$, copy and complete the table below.

V		1	1.5
U	1	4	36

Write an equation relating V and U

15. A body moves such that its distance S metres from a particular point is directly proportional to t^2, where t is the time in seconds. Find:
    a) The value of the constant of proportionality if S = 9. 6 when t = 2
    b) The equation relating S to t
    c) The value of S when t = 4.5 second

16. The table below shows pair of values of x and y

x	2	3	5	6
y	2.8	4.2	7.0	8.4

a) Show that y varies directly as x
b) Find the equation relating y to x
c) Draw the graph of y against x

17. A quantity P varies directly as Q. If P = when Q = 42, Find
    a) An equation which connect P and Q
    b) P when Q = 105
    c) Q when P = 3
18. The volume V, of a pyramid varies directly as its perpendicular height h. The table below shows some pairs of values.

h	2	3	4	5
v	9.0	13.5	18.0	22.5

a) Find the equation relating V to h
b) Draw the graph of V against h

19. If $V \propto {}^{1}/_{t^2}$ and V = 3 when t = 2, find
    a) The constant of proportionality
    b) The value of V when T = 0.8

20. A is inversely proportional to $\sqrt{B}$ and A = 3 when B =4 calculate:
    a) A when B = 0.25
    b) B when A = 1. 2

21. Given that $y \propto {}^{1}/_{x^3}$ and y = 1.25 when x = 2, calculate
    a) The constant of proportionality
    b) y when x = ⅓
    c) x when y = 0.01
22. The weight w kg of a metal varies jointly as its length, 1cm and the square of its diameter dcm. If w = 3.6 when d = 4 and l = 45, find w when d = 5 and l = 52
23. Given that y varies directly as the square root of x and that x = 9 when y =2, find y when x = 144
24. x^2 varies directly as y and inversely to z. Given that x = 3, y = 4 when z = 6. Find the value of x when y = 3 and z = 8
25. A quantity r varies directly proportional to t and inversely as the square of u. If r = 4 when t = 2 and u = 5, find an equation connecting r, t and u.
26. Find the LCM of the following number: 96, 108, 120 and 150
27. How many integer Z are on the interval $-5 \leq Z \leq 20$?
28. Divide the LCM of the numbers 420, 264, 180 and 360 to the GCF.
29. List all common multiples of 8, 12 and 15 that are between 400 and 1000
30. Find the ratio of the GCF to the LCM of 12, 18 and 20.
31. Express 0.4414414 ……. As the ratio of two integers
32. Simplify: $4 + 3\frac{1}{4} \div 1\frac{1}{2} \times \frac{3}{4}$
33. Simplify: $\left(2 - 1\frac{5}{8} \div \frac{7}{8}\right) + \left(1\frac{1}{2} \div \frac{1}{4}\right)$
34. Evaluate: $3\frac{1}{2} \div 21 + 3 \times 1\frac{1}{4} - \frac{5}{6}$
35. Write 1.2 5 in form of $\frac{a}{b}$ where a and b are real numbers and $b \neq 0$.
36. Convert the repeating decimal

    0.5 2 5 to fraction

37. Given that x = 3 1 and y =0.2 5 , find the value of the following
    (a) x + y
    (b) x − y
38. Simplify: $\dfrac{5\frac{1}{3} \div \frac{1}{4}}{1 \div \left(3\frac{1}{4} - \frac{5}{8}\right)}$
39. Write 0.8333… as fraction in the lowest term

40. By converting the repeating decimal $1.\dot{9}$ to fraction, show that $1.\dot{9} = 2$
41. What is the mass, in kilograms of 1500 packets each weighing 5hg, 9dag and 8g?
42. The length of 2.5 cm is what percentage of the length of 5 m?
43. Multiply: 16 dam 7 m 8 dm by 15
44. Divide the following and give your answer in meter:
    (23km 74dam 80dm) ÷6
45. Express the following capacities in litres
    (a) 2.5 cm^3
    (b) 100 dl
    (c) 3000ml
46. Write the 4.20098 into two decimal places
47. Approximate the following numbers to requested significant figure
    (a) 0.0078 one significant figure
    (b) 789.98 four significant figure
48. Write the number of significant figure
    (a) 10500
    (b) 0.00908
49. Estimate; 75.98 ×2.385
50. Approximate; 67.89 ÷19.98
51. Simplify; $\frac{125 \div 0.0025}{8 \div 0.02}$, write your answer to 2 decimal places
52. Convert $\frac{38}{8}$ to decimals, correct to two significant figure
53. Round off to hundredth each of the following numbers
    (a) 9.986
    (b) 0.0497
    (c) 20.5778
54. If in a regular polygon, the ratio of the degree measure of the exterior to interior angle is 1 : 5, find the number of sides of the polygon
55. Find the number of sides of regular polygon whose each interior angle is 135^0
56. The degree measured of two supplementary angle are in the ratio 2 : 3. Find the degree measure of each angle.
57. Find the number of sides of the regular polygon whose exterior angle is 15^0
58. What is the degree measured of each interior angle of a regular polygon having 20 sides
59. Solve for x: $\frac{2x}{5} - \frac{x-2}{3} = \frac{x}{5}$
60. Find the solution of $|2x+5| \leq 11$, present your answer on a number line
61. Simplify: $2\{3x - [2x - (3x+1) + 5x]\}$
62. Find the range of the value of x the satisfy the inequality;
    $2x - 3 \leq x - 1 \leq 3x + 2$
63. The age of the father now is three times that of his son. If in five years to come the age of father will be 5 years more than twice that of his son, find their present age.
64. Solve for p and q from
    $2(p-q) = \frac{1}{3}(2p-q) = 8$
65. If the line $ax - 2y = 5$ and $2x - by = 8$ intersect at point (11, 3). Find the value of a and b.
66. Find $\frac{p}{q}$ if $\frac{3p+q}{5p+2q} = 4$
67. (a) Write 45678 in words

68. List all even numbers between 212 and 222

69. Find the HCF of 24, 36 and 48

70. (a) A piece of cloth is $37\frac{1}{2}$cm long is cut into equal pieces each $1\frac{1}{2}$cm long. How many pieces can be obtained.

71. Write 0. 2 3 in form of $\frac{a}{b}$ where b $\neq 0$

72. (a) Doto scored 40 out of 80 in mathematics examination. What percentage was this?

73. One litre of cooking oil cost 700shs. Find the cost of 15 litres.

74. (a) Write 845 961 correct to **1 significant figure.**

75. Write $\frac{3}{4}$ in decimal form correctly to **1 decimal place**

76. Simplify: $(\frac{3a^2}{4b})(\frac{2}{a})^{-4}$

77. Solve for x; $125^x = 5$

78. Solve for y; $2^{8y} = 512$

79. Solve for x; $4^{5x} \div (2^{3x})^2 = 256$

80. Solve for x if $(3^{2x})^4 = 81$

81. Find the value of y such that;
$$5^{(y+1)} \times 125^{(3y+1)} = 25^{(y-2)}$$

82. Find the value of y for which
$$2^y \times 16 = \frac{1}{8^y}$$

83. Find the value of x and y given that
$$x^{(2y+1)} = x^{(3y-1)} = 243$$

84. Find the value of t in the equation
$$3^{2t}(4^t) = 6$$

85. Use the substitution of $y = 2^x$ to solve the equation $2^{2x+1} - 2^{x+1} + 1 = 2^x$

86. Solve for x in the equation
$$9^{(x-3)} \times 81^{1-x} = 27^{-x}$$

factorize the following expression by spliting the middle term

87. $2x^2 + 3x + 1$

88. $3x^2 - 11x - 20$

Evaluate the following

89. $83.1^2 - 16.9^2$

90. $787^2 - 213^2$

What must be added in each of the following to make it a **perfect square**

91. $x^2 + 4x$

92. $x^2 - 6x$

Factorize each of the following by **INSPECTION METHOD**

93. $5x^2 - 15x + 10$

94. $2x^2 - 16x + 24$

Factorize the following expression

95. $2a - 4b$

96. $12x - 8$

97. $2a - 4ab + 6ac$

Expand each of the following express
and write in form of $ax^2 + bx + c$

98. $(x + 1)(x + 2)$

99. $(x - 2)(x - 3)$

100. $\log_2 (x + 6) = 1$