STAHIZA S3 MATHEMTICS RECESS WORK 2020

1. Express the HCF of 18, 30 and 24 as a fraction of their LCM it's in its lowest terms
2. Solve for m if $\frac{6^{(3m-1)}}{8} = \frac{27}{36^{m}}$
3. Without using tables: Find the value of **K**.

   $\log\left(\frac{11}{2}\right) + 2\log\left(\frac{4}{11}\right) - \log\left(\frac{5}{22}\right) = \log K - \log 10.$

4. Given sets: A = { All natural numbers between10 and 30}

   B = { All prime numbers between 10 and 30}

   Find (i) members of set A ∩ B (ii) n(A ∩ B)

5. Express $0.2454545\ldots$ as a fraction in its simplest form.
6. Given that $f(y) = 3y - 2$ and $g(y) = y^2$,find the values of y for which $gf(y) = 16.$
7. a) Simplify $\frac{\sqrt{112} + \sqrt{28}}{\sqrt{175} - \sqrt{63}}$ in its simplest form.

   b) Express: $\left(\frac{3}{3\sqrt{2}-2\sqrt{5}}\right) - \left(\frac{1}{3\sqrt{2}+2\sqrt{5}}\right)$ in the form $a\sqrt{2} + b\sqrt{5}$. State the values of a and b.

8. The coordinates of points A and B are $(-6,15)$ and $(4,5)$ respectively. X is a point on **AB** such that $AX : XB = 1 : 4$. Find (i) **AB** (ii) **OX**
9. A certain sum of money borrowed from a SACCO amounted to $Shs.186,000$ in only 8 months at an interest rate of 5% per annum. Calculate the interest earned using.
   i) Simple interest
   ii) Compound interest
10. The scale of a map is $1 : 500,000$. A forest is represented on the map by a patch of area $2.4cm^2$. Find the area of the forest on actual ground in Km^2.

11. A group of 100 people gave information about 3 attributes; wearing glasses, being left handed and having dark hair.
36 people wore glasses, 28 were left handed and 36 had dark hair. 17 who wore glasses and were left handed.19 who wore glasses and had dark hair 15 who were left handed and had dark hair. Only 10 people wore glasses, were left handed and had dark hair.

(a)Represent these data on a Venn diagram.

(b)How many people;

(i) wore glasses but was not left handed and did not have dark hair?
(ii) did not wear glasses, were not left handed and did not have dark hair?
(iii)had only two of the attributes?

12. (a) The ages of Irene and Rita are in the ratio of **15 : 8** respectively. In ten years,

the ratio of Irene's age to Rita's age will be **5 : 3**. Find;-

i. the present ages of Irene and Rita.
ii. If **"t"** years ago Irene was **five** times as old as Rita, find the value of **t**.

(b) Six men can cultivate an area of **280m^2**in 2 hours. What area would **five** men cultivate in 3 hours working at the same rate?

13. (a) The function f is such that $f(x) = 3x + 1$. Find:

i. $f^{-1}(5)$

(b) Given that $f(x) = ax^2 + bx \; and \; f(3) = 24, f(2) = 12$, find the
i $value \; a \; and \; b$ ii $f(2)$

14. A total of **100** vehicles were inspected and **60** vehicles passed the road worthy

test. The rest of the vehicles (remainder) had faults in: Brakes (**B**), Lights (**L**) and steering (**S**) as follows;- $n(B \cap L \cap S) = 3$; $n(B \cap S^I \cap L^I) = 12$; $n(B \cap S) = 5$; $n(B \cap L) = 8; n(S \cap L \cap B^I) = 2$ and $n(S \cap L^I \cap B^I) = n(L \cap S^I \cap B^I)$.

(a) Represent the given information on a venn-diagram.

(b) How many vehicles had:
   i. Faulty steering.
   ii. One fault only.

(c) If a vehicle is chosen at random; find the probability that it had at least **two faults.**

15. Below are the marks scored by 50 students in a chemistry test

32	11	42	51	68	36	33	29	59	32
22	56	32	78	45	15	47	53	62	46
37	63	27	47	25	42	25	30	49	23
66	41	56	35	49	73	58	48	17	53
58	31	72	40	65	55	39	28	44	64

(a) Construct a frequency distribution table with equal class intervals, starting with 10 – 19

(b) Draw a cumulative frequency curve and use it to estimate the

(i) Median mark

(ii) Number of students who scored 35% and above

(c) Calculate the mean mark

16. (a) For values of x : $-4 \leq x \leq 4$, draw the graphs of y = 6 + $x - 2x^2$ and $y = 5x$

Using 2cm : 1 unit horizontally and 2cm : 5 units vertically.

(b) Use your graph in (a) above to solve the simultaneous equations y =6 + x – $2x^2$ and y = 5x.

17. Given that h(x) = ax^2 + bx whose h(-1) = 3 and h(1) = -1. Find the values of a and b.

18. Given that f(x) = x – $2x^2$ and g(x) = 3 – x

Determine (i) expressions for gf(x)

(ii) the values of gf(-2)

19. Given that f(x) = $\frac{9x}{(x+6)(x+2)}$

find i) $f(4)$

ii) value of x for the function to be undefined

20. (a) John deposited shs. 3,500,000 in a bank which offers a compound interest of 12% per annum. How much money did he have in the bank at the end of two years?

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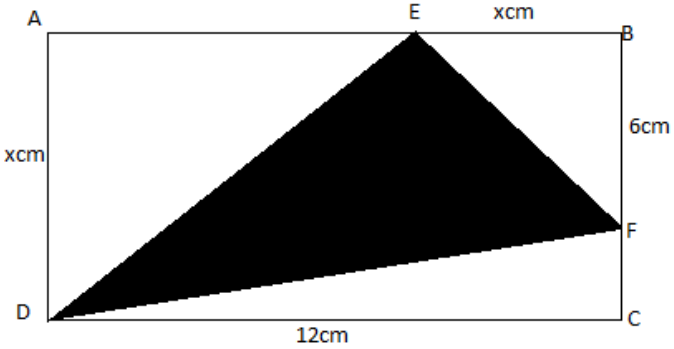
21. In the figure below, ABCD is a rectangle 12cm long and xcm wide. Given that $\overline{EB}$ = xcm, $\overline{BF}$ = 6cm and that the unshaded area is 52cm^2,



find;

i) The value of x

ii) The shaded area.

22. A plane flew from town A on a bearing of 050^o to town B at a speed of 100kmh $^{-1}$ for 5 hours. From B, the plane changed course and flew on a bearing of 110^o to town C at a speed of 150 kmh^{-1} for 4 hours.

(a) Calculate the
   (i) Distance of town C from town A
   (ii) Bearing of town C from town A

b) If the plane return from town C directly to town A at a speed of 200kmh $^{-1}$ how long will it take?

23. Make x the subject of the formula $\frac{L}{T} = \frac{x^2 - a}{x^2 + a}$

24 .Express $\frac{2+\sqrt{3}}{2-\sqrt{3}}$ in the form $p + q\sqrt{r}$. Hence state the values of p, q and r.

25. Without using tables or a calculator, evaluate $\frac{32.135^2 - 17.865^2}{0.7135}$

26. Given two points A(4, 5) and B (-2, 9) find the equation of a line through A and B.

27. A cylindrical tank of diameter 1.4m has a capacity of 3.08m^3. Find the diameter of a similar tank whose capacity is 83.16m^3.

28. Given that $x^2 - y^2 = 16$ and $x + y = 8$, determine the values of x and y

29.Given that $a * b = \frac{b^2 - a^2}{a^2 + b^2}$

Find the value of ; (i) (1 * $^{-}$1) (ii) (1 * $^{-}$1) * $^{-}$4

30. Solve the equation $\frac{x+2}{3}-\frac{8-x}{2}=\frac{x}{6}$

31. Make *t* the subject of the formula $s = ut + {}^{1}/_{2}\,at^2$.

32. The sides of a triangle are in the ratio 3:4:5 and the perimeter is 48cm. Find the area of the triangle.

33. The mode of *3, 10, 8, 4, 4, 1, 2, x, 3, 2* is 3. Find

(i) The value of *x*
(ii) The median

34. Factorize completely $x^2 - 4xy + x - 4y$.

35. Solve the equation $\frac{x}{(x+3)} + \frac{7}{x^2-9} = \frac{5}{x^2-9}$

36. a Given that $a * b = a^b - 5$. Evaluate

(i) $2 * 3$
(ii) $(2 * 3) * 4$
b) Given that $m * l = (3m - l)l$, find the value of $(1 * 2) * 4$

37. Make K the subject of the formula $\frac{1}{n^2}=\frac{K^2+a^2}{hg}$.

Hence evaluate K if $h = 2,\ n = 1.6, a = 3\ and\ g = 32$.

38. Given that the solutions of the equation $ax^2 + bx + c = 0$ are -9 and 2, state the values of a, b and c.

39. Factorise completely $5a^2 - 20$. Hence solve the equation $5a^2 - 20 = 0$

40. The goals scored by some players in a tournament are summarized in the table below

Goal	1	2	3	4	5
No of players	2	A	3	2	1

If the mean number of goals scored is 2.8. Determine how many players scored 2goals?

41. Solve the simultaneous equations

$2x + 5y = 12$
$3x - y - 1 = 0$ using
Matrix ,Elimination ,Substitution method

42. In a class, the ratio of boys to girls is 3:2. If five boys leave the class and 10 girls join the class, the number of boys will be the same as that of girls. How many pupils are in the class?

43. Given that tanθ = ¾ and θ is a reflex angle. Without using tables or a calculator, evaluate Sinθ + Cosθ.

44. Solve the inequality $2x^2 - 2x - 15 < 0$

45. a) Using a suitable table of values, draw the curve $y = 3 + 5x - 2x^2$ for $-3 \le x \le 4$.

b) Use the graph to solve the equations.

i) $3 + 5x - 2x^2 = 0$ ii) $2 + 3x - 2x^2 = 0$ iii) $6 - x - x^2 = 0$

c) State the maximum point and the equation of line of symmetry.

46. i)If the matrix $\begin{pmatrix} n+4 & 3 \\ 4 & n \end{pmatrix}$ has no inverse/ singular, Find the possible values of n

ii) Given that the determinant of $\begin{pmatrix} x & 1 \\ 3x & 2x \end{pmatrix}$ is 10, find the values of x.

47. A factory makes three products X,Y and Z. The table below shows the units of labour materials and other items needed.

	Labour	Materials	Other item
X	4	1	2
Y	2	4	1
Z	1	5	2

Labour costs shs 2000 per unit, material shs 3000 per unit and other item cost shs 5000 per unit.

(i) Write down a matrix representing the products

(ii) Write down a cost matrix

(iii) Using matrix multiplication, determine the cost of each product X, Y and Z in shillings.

END **MJ@2020**

And mathematics became a friend