SUCCESS ACADEMIC FOUNDATION OF UGANDA (SAFU)

PRE - PRIMARY LEAVING EXAMINATION SET III, 2022

MATHEMATICS

Time Allowed: 2 Hours 30 Minutes

EMIS NO	PERSONAL NO

Candidate's Name: _____

Candidate's Signature: _____

School Name: _____

District Name: _____

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Read the instructions carefully:

1. This paper is made up of Sections A and B.
2. Section A has 20 short-answer questions. (40 marks)
3. Section B has 12 questions. (60 marks)
4. Answer All questions. All answers to both Sections A and B must be written in the spaces provided.
5. All answers must be written using blue or black ball point pen or ink.
6. Diagrams should be drawn in pencil
7. Unnecessary alteration of work may lead to loss of marks.
8. Any handwriting that cannot be read may lead to loss of marks.
9. Do not fill anything in the box indicated For Examiners' Use Only.

FOR EXAMINERS' USE ONLY		
Qn. No.	MARKS	Final Mark
1 - 5		
6 - 10		
11 - 15		
16 - 20		
21 - 22		
23 - 24		
25 - 26		
27 - 28		
29 - 30		
31 - 32		
TOTAL		

Turn Over

Offices on Gadafi Rd, Plot 201,Opposite Gateway Bus Garage Tel:0774-488552 / 0705-004736, Mityana Taxi park on Kamusese building Rm1Near Kampala Stage Tel:0753396322, Tororo Market street Opposite UMEME Office Tel 078;520834 / 0705508135

SECTION A: (40 MARKS)

Questions 1 to 20 carry two marks each.

1. Workout:
$$\begin{array}{r} 210 \\ +\ 21 \\ \hline \\ \hline \end{array}$$

2. Simplify: $4xy + y + xy$

3. Write the value of four hundredths in figures.

4. How many proper subsets can you obtain from the given set below?

K

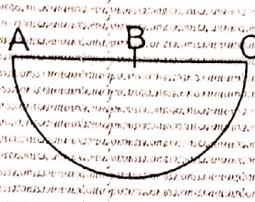
(m, n, t, y)

5. Move four metres backwards and four more metres still backwards. Write your last position using integers.

6. Express 7½ kg to grammes.

7. When the taxi arrives at the park at 11:35 a.m, it is 25 minutes late. What is the correct time of arrival on the 24-hour clock?

8. The area of the semi-circle below is 77cm². Calculate the length AB. (Take $\pi = \frac{22}{7}$)



9. The price of a shirt increased from sh. 36,000 to sh. 48,000. Find the ratio in which the price increased.

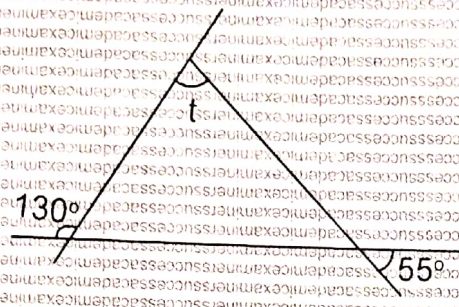
10. Work out $4 \times 5 \pmod 6$

11. A cup is ¾ full of milk. Rashida took ⅓ of it. What fraction of the milk remained?

12. Draw a net of a tetrahedron in the space below

13. The median of 5 consecutive integers is -1. Find their range.

14. Use the diagram below to find the size of angle marked t.

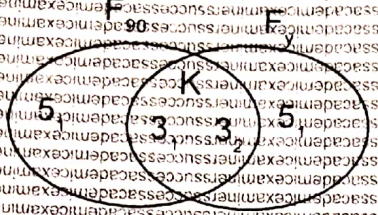


15. A trader sold a pair of shoes at sh. 65,000 and made a loss of sh. 8,000. What is the trader's cost price of the shoes?

16. Work out $(21 \times 123) + (277 \times 21)$

17. A rider took 40 minutes to cover a journey while moving at a speed of 24 km / hr. Calculate the distance the rider covered.

18. Use the diagram below to find the value of k



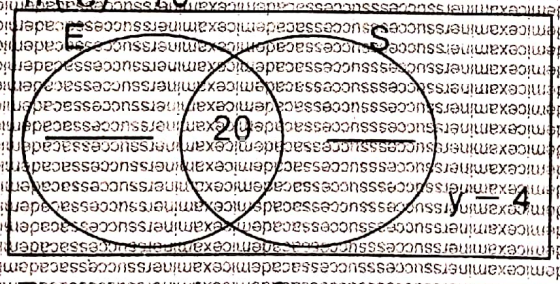
19. The area of a square compound is $12\frac{1}{4}$ m². Find the length of each side.

20. Subtract $3p - 2$ from $4p + 3$

SECTION B

21. In a class of 71 pupils, 37 like Science, 20 like both Science and English (E), y like English only while $(y - 4)$ like neither of the two subjects.

a) Use the information above to complete the Venn diagram below. (2 marks)



b) Find the value of y. (2 marks)

c) What is the probability of picking a pupil at random who likes English? (1 mark)

22. a) Solve: $\frac{m}{3} + 1 + \frac{m}{4} = 2$ (3 marks)

b) Solve the Inequality: $\frac{2}{3}p - 4 \geq 6$ (2 marks)

23. A regular polygon has an exterior angle 45°

a) How many right angles has the polygon? (3 marks)

b) Calculate the interior angle sum of the polygon (2 marks)

24. a) Find the value of 3 in 324_{five} (2 marks)

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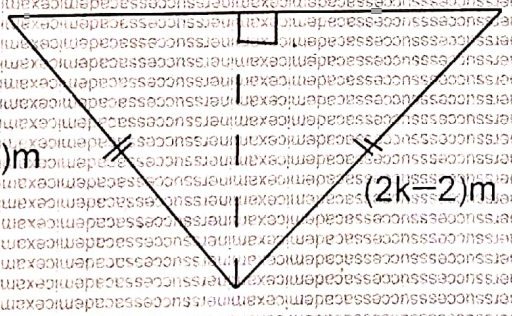
b) Change 213_{four} to three. (3 marks)

25. Town P is 360 km away from Q. A gate way bus left town P at 7:00 a.m travelling at a steady speed of 108 km / hr to town Q. After one, the bus broke down and the repair took 45 minutes. At what speed was the bus moving to cover the remaining journey if it reached town Q at 11:00 a.m. (6 marks)

26 Study the figure below and answer the questions that follow.



a) Find the value of K. (2 marks)

b) Work out the area of the figure. (3 marks)

27. A candidate scored the following marks at the end of the term II exams.

Maths	Eng	Sci	S.st	R.E
50	m	70	45	55

a) If the average mark is 57, how many marks did he score in English? (3 marks)

b) How many subjects did he score above the average? (1 mark)

c) Calculate the candidates range mark. (1 mark)

28. A tank is ½ full of water. When ¼ of the water is added, its capacity becomes 120 l. Find the capacity of the tank when full. (4 marks)

29. a) Find the least number of girls when grouped in fives, 3 girls remain and when grouped in sevens 2 girls remain. (3 marks)

b) A frog jumped three steps four times before diving into the water.
What distance did the frog make before entering the water? (2 marks)

30 Mustafah deposited some money on a fixed account. If the bank paid him an interest of sh. 36,000 at the rate of 10% per annum for 9 months.

a) How much money did he deposit? (3 marks)

b) How much money did he have in the bank after the 9 months? (2 marks)

31 The table below shows the exchange rates at a certain Forex Bureau. Use it to answer the questions that follow.

Currency	Buying rate	Selling rate
1 US($)	Ug.sh 3,600	Ug.sh 3,650
1 Kenya sh	Ug.sh. 36	Ug.sh. 37
1 Euro (€)	Ug.sh 4,000	Ug.sh 4,020

a) Convert Ug. sh 482,400 to Euro. (2 marks)

b) How many Us dollars can be exchanged for Ksh.32,850? (3 marks)

32. A steamer left Kalangala for Mombasa a distance of 50km on a bearing of 070°. It left Mombasa for Bukakata a distance of 60km on a bearing of 220°

a) Draw a sketch diagram to show the three places. (1 mark)

b) Using a scale of 1cm = 10km, draw an accurate diagram to show the three places. (4 marks)

END

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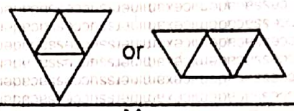
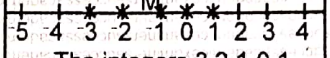
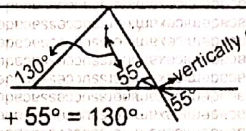
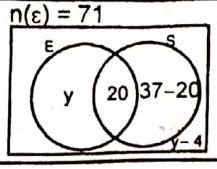
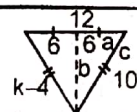
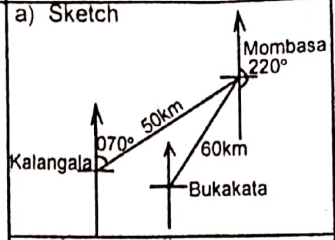
MATHEMATICS MARKING GUIDE

No	SOLUTION	MARK	COMMENT
1.	2 1 0 + 2 1 2 3 1	B_2	Award on sight of 231
2.	$4 \times y + y + xy$ $4 \times y + xy + y$ $5 \times y + y$	M_1 A_1	-for collecting like terms - for $5 \times y + y$
3.	$4 \times \frac{1}{100} = \frac{4}{100}$ or 0.04	B_2	- follow through
4.	Proper subset $= 2^n - 1$ $= 2^4 - 1$ $=(2 \times 2 \times 2 \times 2) - 1$ $= 16 - 1$ = 15 proper subsets	M_1 A_1	- for expanding - for 15
5.	$^-4 + ^-4 = ^-4 - 4$ $= ^-8$ The last position is $^-8$	M_1 A_1	- for mathematical - for -8
6.	1kg = 1000gm $7\frac{1}{2}$kg = $(\frac{15}{2} \times 1000)$ $= (15 \times 500)$gm = 7500gm	M_1 B_2	- for working - for 7500gm Emphasize units
7.	11: 35 a.m - 25 11: 10 a.m correct time is 11:10a.m 11:10 00:00 11:10 hours	M_1 A_1	- for 11:10a.m - for 11:10 hours
8.	$A = \frac{1}{2}\pi r^2 h$ $77cm^2 = \frac{1}{2} \times \frac{22}{7} r^2$ $7 \times 77cm^2 = \frac{11r^2}{7} \times 7$ $\frac{7 \times 77^{7} cm^2}{11} = \frac{11 r^2}{11}$ $7 \times 7cm^2 = r^2$ $\sqrt{7 \times 7cm^2} = \sqrt{r^2}$ $7cm = r$ $\therefore AB = 7cm$	M_1 A_1	- follow through correct working - for 7cm
9.	Increase from sh 36,000 to sh. 48,000 Increase in ratio = New amount : old amount $= \frac{sh.48,000^{4}}{sh.36,000_{3}}$ $= \frac{4}{3}$ = 4:3	M_1 B_1	- for correct - for 4:3
10	$4 \div 5 \pmod 6$ $(6 - 4) \div 5 \pmod 6$ $10 \div 5 \pmod 6$ $2 \pmod 6$	M A	- follow through
11.	$\frac{3}{4}^{\times 3} - \frac{1}{3}^{\times 4} = \frac{3\ 3\ 14}{12}$ $= \frac{9+4}{12}$ $= \frac{5}{12}$	M_1 A_1	- follow though correct working
12.		B_2	-follow through
13.	 The integers 3 2 1 0 1 Range = H – L $= 1 - ^-3$ $= 1 + 3$ $= 4$	B_1 A_1	- for listing integers - for 4
14.	 $t + 55° = 130°$ $t\ 55° - 55° = 130° - 55°$ $t = 75°$	M_1 A_1	- for equation formed - for 75°
15.	Cost price = S.P Loss = sh. 65,000 - sh. 8,000 Cost price = sh. 57,000	M_1 A_1	- for working - for sh. 57,000
16.	$(21 \times 123) + (277 \times 21)$ $21(123 + 227)$ $21 + 400$ 8400	M_1 A_1	for working for 8400
17.	$D = S \times T$ $= \frac{^{4}24}{1} km \times \frac{40\ mins}{60\ mins}$ $= 4\ km \times 4$ = 16km	M_1 B_1	- for working
18.	$F90 = \{k_1, 3_1, 3_2, 5_1\}$ $90 = k \times 3 \times 3 \times 5$ $90 = 45k$ $\frac{90}{45} = \frac{45k}{45}$ $2_1 = k$	M_1 A_1	- for multiplying
19.	$A = S \times S$ $12\frac{1}{4} = S^2$ $\frac{49}{4} m^2 = S^2$ $\sqrt{\frac{49}{9} m^2} = \sqrt{S^2}$ $\frac{7}{2} m = S$ $3\frac{1}{2} m$ = side	M A	follow through and emphasize units
20	$(4p - 3) - (3p - 2)$ $4p - 3 - 3p + 2$ $4p - 3p - 3 + 2$ $p - 5$	M A	for removing brackets for $p - 5$

No	SOLUTION	MARK	COMMENT
21	a) $n(\varepsilon) = 71$ 	B_1 B_1	for y for 37−20 or 17
	b) $y + 20 + 17 + y - 4 = 71$ $y + y + 37 - 4 = 71$ $2y + 33 = 71$ $2y + 33 - 33 = 71 - 33$ $2y = 38$ $\frac{2y}{2} = \frac{38}{2}$ $y = 19$	B_1 A_1	-for formation of equation for 19
	c) English = $y + 20$ $= 19 + 20$ $= 39$ Prob = $\frac{n(E)}{n(S)} = \frac{39}{71}$	 B_1	 for $\frac{39}{71}$
22.	a) $\frac{m+1}{3} + \frac{m}{4} = 2$ LCM is 12 $\frac{4\cancel{12}(m+1)}{\cancel{3}} + \frac{m}{4} \times \frac{\cancel{12}^3}{} = 2 \times 12$ $4(m \times 1) + 3m = 24$ $4 \times m + 4 \times 1 + 3m = 24$ $4m + 3m + 4 = 24$ $7m + 4 - 4 = 24 - 4$ $7m = 20$ $\frac{7m}{7} = \frac{20}{7}$ $m = 2\frac{6}{7}$	M_1 M_1 A_1	 follow through correct working
	b) $\frac{2p}{3} + 4 > 6$ $\frac{2p}{3} - 4 + 4 > 6 + 4$ $\frac{\cancel{3} \times 2p}{\cancel{3}} = 10 \times 3$ $2p > 30$ $\frac{2p}{2} > \frac{30}{2}$ $p > 15$	 M_1 A_1	
23.	a) Number of sides = $\frac{360°}{\text{Ext}\angle}$ $= \frac{\cancel{360°}}{\cancel{45°}}$ = 8sides Right angles = $2n - 4$ $= (2 \times 8) - 4$ $= 16 - 4$ $= 12$	 M_1 B_1 A_1	 follow through other methods
	b) Interior angle sum $= 180°(n - 2)$ $= 180°(8 - 2)$ $= 180° \times 6$ $= 1080°$	 M_1 A_1	
24.	Time between 7:00 to 11:00a.m 11:00 7:00 4:00hours Distance before broke down $D = S \times T$ $= \frac{108\text{km}}{\cancel{1\text{hr}}} \times \cancel{1\text{hr}} = 108\text{km}$	 B B_1	follow through correct working and emphasize units for 108km

No	SOLUTION	MARK	COMMENT
	Distance left 360km −108km 252km	 B_1	 for 252km
	Time left 4 : 00 1 : 45 2 : 15 = 2¼hours	 B_1	 for 2¼hours
	Speed used for remaining journey $S = D \div T$ $= 252\text{km} \div 2\frac{1}{4}$ $= 252\text{km} \div \frac{9}{4}\text{hrs}$ $^{28}\cancel{252}\text{km} \times \frac{4}{\cancel{9}}\text{hrs}$ 28km × 4hr 112km/hr	 M_1 A_1	 for division for 112km/hr
25.	a) $3^2\,2^1\,4^0{}_{\text{five}}$ 3×5^2 $3 \times 5 \times 5$ 15×5 75	 M_1 A_1	 for working
	b) <table><tr><td>2</td><td>1</td><td>3</td></tr><tr><td>4^2</td><td>4^1</td><td>4^0</td></tr></table> $(2 \times 4^2) + (1 \times 4^1)(3 \times 4^0)$ $2 \times 4 \times 4 + 1 \times 4 + 3 \times 1$ $32 + 4 + 3$ 39 <table><tr><td>B</td><td>N</td><td>R</td></tr><tr><td>3</td><td>39</td><td></td></tr><tr><td>3</td><td>13</td><td>0</td></tr><tr><td>3</td><td>4</td><td>1</td></tr><tr><td></td><td>1</td><td>1</td></tr></table> $\therefore 213_{\text{four}} = 1110_{\text{three}}$	 M_1 A_1	 -for expanding B_1 - for 39 - for 1110_{three}
26	a) $\frac{(2k-2)\cancel{m}}{\cancel{m}} = \frac{(k+4)\cancel{m}}{\cancel{m}}$ $2k - 2 = k + 4$ $2k - k - 2 = k - k + 4$ $k - 2 + 2 = 4 + 2$ $k = 6$	M_1 A_1	- for equation formed -for 6
	b)  $a^2 + b^2 = c^2$ $6m^2 + b^2 = 10m^2$ $6 \times 6m^2 + b^2 = 10 \times 10m^2$ $36m^2 + b^2 = 100m^2$ $36m^2 - 36m^2 + b^2 = 100m^2 - 36m^2$ $b^2 = 64m^2$ $\sqrt{b^2} = \sqrt{64m^2}$ $b = 8m$ $A = \frac{1}{2} \times b \times h$ $= \frac{1}{\cancel{2}} \times \cancel{12}^6\text{m} \times 8\text{m}$ $= 48m^2$	M_1 B_1 A_1	- for correct formular and substitution - fo 8m -for $48m^2$

No	SOLUTION	MARK	COMMENT
27.	a) Sum of items / No. of items = Average		
	$\frac{50 + m + 70 + 45 + 55}{5} = 57$	M_1	- for correct working
	$5 \times \frac{m + 220}{5_1} = 57 \times 5$		
	$m + 220 = 285$	M_1	- for method
	$m + 220 - 220 = 285 - 220$		
	$m = 65$	A_1	- for 65 marks
	English is 65marks		
	b) 2 subjects	B_1	- for 2
	c) Range = H – L		
	= 70 – 45		
	= 25	B_1	- for 25
28.	Fraction added		
	$\frac{1}{2}$ of $\frac{1}{4} = \frac{1}{2} \times \frac{1}{4}$		
	$= \frac{1}{8}$	M_1	- for $\frac{1}{8}$
	Fraction of water in the tank		
	$\frac{1}{2} + \frac{1}{8} = \frac{4+1}{8} = \frac{5}{8}$	A_1	for $\frac{5}{8}$
	Let the capacity be k		
	$\frac{5}{8}$ of k = 120litres		
	$\frac{5}{8} \times k = 120$ litres		
	$8 \times \frac{5}{8} k = 120\text{litres} \times 8$	M_1	- for working
	$5k = 120 \times 8$		
	$\frac{5k}{5} = \frac{120 \times 8}{5}$		
	k = 192 litres	M_1	-for 192 litres
29.	a) 3(finite 5)		
	2(finite 7)		
	3, 8, 13, 18, 23, 28, 33, 38...	B_1	follow through
	2, 9, 16, 23, 30, 37.....	B_1	correct working
	The least No. of girls is 23	A_1	
	b) Distance		
	3 × 4 = 12	B_2	
30	a) I = P × R × T		
	sh. 36000 = $P \times \frac{10}{100} \times \frac{9}{12}$	M_1	- follow through correct working
	$40 \times$ sh. 36000 = $\frac{3p}{40} \times 40$	M_1	
	$\frac{40 \times \text{sh. } 36000}{3} = \frac{3p}{3}$		
	sh.480,000 = p		
	He deposited sh. 480,000	A_1	
	b) A = P + I		
	= sh. 480,000		
	+ sh. 36,000	M_1	
	sh. 516,000	A_1	
31.	a) Ug.sh. 4020 = 1 Euro		
	Ug.sh.482,400 = Ug.sh 482400	M_1	follow through
	Ug. sh 4020		correct working
	Euro = 120	A_1	
	b) Ksh.1 = Ug sh 36		
	Ksh 32850 = Ug sh 36 × 32850		
	= Ug.sh 1 182 600	B	
	Ug sh 3650 = Ug.sh 1 182 600	M	
	Ug sh 3650		

No	SOLUTION	MARK	COMMENT
	= US $ = 324	A_1	
32.	a) Sketch		
		S_1	
	Accurate diagram		
	10km = 1cm		
	50km = $\frac{5\theta}{1\theta}$		
	= 5cm		
	10km = 1cm		
	60km = $\frac{6\theta}{1\theta}$		
	= 6cm		
		L_1	- for 5cm
		L_1	- for 6cm
		C_1	- for 220°
		C_1	- for 070°