LABASA SANGAM (SKM) COLLEGE

YEAR 12

MATHEMATICS

WORKSHEET # 1

STRAND 1 BASIC MATHEMATICS

1. What is $2\log 8 + \frac{1}{4}\log 16 - 2\log 4$ when expressed as the logarithm of a single numberequal to?

A. $\log \frac{5}{2}$

B. $\log 8$

C. $\log 12$

D. $\log 52$ (1 mark)

2.The table below shows the results of an operation * on the set S = {a,b,c,d}

*	a	b	c	d
a	d	a	b	c
b	a	b	c	d
c	b	c	d	a
d	c	d	a	b

The identify element for the operation is

A. a B. b
C. c D. d (1 mark)

3. When simplified $\frac{3}{2+\sqrt{7}}$is equivalent to

A. $2 + \sqrt{7}$ B. $2 - \sqrt{7}$

C. $-2 - \sqrt{7}$ D. $-2 + \sqrt{7}$ (1 mark)

4. The expression $7\sqrt{2} + 3\sqrt{5} - 2\sqrt{2} - 6\sqrt{5}$ when simplified is equal to

A. $10\sqrt{5} - 8\sqrt{2}$ B. $10\sqrt{15} - 8\sqrt{15}$

C. $5\sqrt{2} + 3\sqrt{5}$ D. $5\sqrt{2} - 3\sqrt{5}$ (1 mark)

5. $\frac{\log h^5 - \log h^2}{\log h}$ in its simplest form is equal to

A. $\log h^3$ B. $\log h^2$

C. 2 D. 3 (1 mark)

6. When simplified $2^{5m} \times 2^{2m}$ equals

A. 2^{7m} B. 2^{3m}

C. 4^{7m} D. 4^{3m} (1 mark)

7. If e is the identity element for an operation #, then $(a\#e)$ is equal to

A. a B. e C. 0 D. 1

(1 mark)

8. Find the following:

(i) 11 mod 3
(ii) 5 mod 5 (1 mark)

9. Simplify $\sqrt{\frac{a^2c^4}{243}}$ (2 marks)

10. Solve $4^{2x+1} = 27$ (2 marks)

11. The table given below shows the set { 0,1,2,3,4} under the operation addition modulo 5. Use the table to answer parts (i)-(iv).

+	0	1	2	3	4
0	0	1	2	3	4
1	1	2	3	4	0
2	2	3	4	0	1
3	3	4	0	1	2
4	4	0	1	2	**P**

i. Find the value of **p.** (1 mark)

ii. What is the **identity element?** (1 mark)

iii. Give the inverse of 2. (1 mark)

iv. Evaluate (1+2)+3 (1 mark)

12. Evaluate $\frac{4^{n+1} \times 2^2}{2^{2n+5}}$ (2 marks)

13. A new TV set costs \$690 cash. It is available on hire purchase by paying a deposit of 15% followed by 15 monthly installments of \$55.85.

i. Calculate the deposit (1 mark)

ii. Find the total of the installments (1 mark)

iii. Work out the total amount to be paid (1 mark)

iv. Which choice is better: buying on hire purchase or buying on cash? (1 mark)

14. Solve for x in $\log_2 30 = x$. (2 marks)

15. The table given below shows the result of a binary operation * on set S = { p, q, r, s}

*	p	q	r	s
p	r	s	p	Q
q	s	p	q	R
r	p	q	r	S
s	q	r	s	Q

Show that the system (S, *) is a group (2 marks)

16. If x = log 2 and y = log 3, write the expression for log 36 in terms of x and y. (2 marks)

17. $(27\ a^{\frac{3}{4}})^{\frac{1}{3}} \times \left(9a^{\frac{-3}{2}}\right)\left(9a^{\frac{-3}{2}}\right)^{\frac{-1}{2}}$ (2 marks)