BA SANGAM COLLEGE
YEAR 12
MATHEMATICS
WORKSHEET 5

STRAND 1: BASIC MATHEMATICS II

1. The table below is for 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 inverse element for **c**, (c^{-1}) is

A. a

B. b

C. c

D. d

2. When simplified $8+\sqrt{7}+6\sqrt{7}$ is equal to

A. $8+7\sqrt{7}$

B. $14+2\sqrt{7}$

C. $\sqrt{57}$

D. $\sqrt{28}$

3. Nemani bought a guitar on the following **terms**:

- $0 deposit.
- 10 monthly instalments of $50.

The **total amount** he paid for the guitar was

A. $10

B. $50

C. $500

D. $600

4. Simplify: $\frac{16^{6x}}{4^{2x}}$ **(2 marks)**

5. Solve the equation $5^{2x} = 125^{2x+1}$ **(1 mark)**

6. The table given below shows the set {0, 1, 2, 3, 4} under the operation **additi**
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 4. **(1 mark)**

(iv) Evaluate $(1 + 3) + 4$ **(1 mark)**

7. Simplify $\frac{1}{2+\sqrt{3}}$ by rationalizing the denomenator **(2 marks)**

STRAND 2: ALGEBRA

1. When simplified $\frac{x^2-9}{x+3}$ equals

A. $x-3$

B. $x+3$

C. $\frac{1}{x+3}$

D. $\frac{1}{x-3}$

2. The solution set for $-2x+2 \geq 4$ is given by

A. $x<-1$

B. $x \leq -1$

C. $x \geq -1$

D. $x>-1$

3. If a polynomial $f(x)$ is divided by $x+2$, the **remainder** is

A. $f(x+2)$

B. $f(x-2)$

C. $f(-2)$

D. $f(2)$

4. Using the **quadratic formula** $x=\frac{-b \pm \sqrt{b^2-4ac}}{2a}$, solve the equation $3x^2+11x+6=0$. **(2 marks)**

5. A sequence is defined as $T_{n+1} = [T_n]^2 - T_n$ and $T_1 = -2$. Find the 4th term of the sequence. **(2 marks)**

6. Evaluate:

$$\sum_{r=1}^{3} \left(2^r - 1\right)$$ **(2 marks)**

7. A polynomial function is given by $f(x) = x^3 - 5x^2 - 2x + 24$.

(i) Show that (x + 2) is a factor of f(x) **(1 mark)**

(ii) Using long division method or by any other means, write down the other two factors of $f(x)$. **(2 marks)**

8. Simplify $\frac{x^2 + 2x}{8} \div \frac{x+2}{16}$ **(2 marks)**

9. A sequence is given as $\langle 27, 9, 3, 1, \ldots \rangle$

(i) Find the 8th term. **(1 mark)**

(ii) Calculate the **sum** of **all** the terms of this sequence. **(1 mark)**

10. Make x the **subject** of the formula $y = \frac{3x+1}{x-5}$ **(2 marks)**