

SEPTEMBER 2022
EMA 201SW
NATURE OF MATHEMATICS
1 HOUR 30 MINUTES

Candidate's Index Number	
1E/MA	
Signature	

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
SCHOOL OF EDUCATIONAL DEVELOPMENT AND OUTREACH
INSTITUTE OF EDUCATION

FIVE-SEMESTER BACHELOR OF EDUCATION (SANDWICH) PROGRAMME
LEVEL 300, END-OF-FIRST SEMESTER EXAMINATION, SEPTEMBER 2022

6TH SEPTEMBER 2022

NATURE OF MATHEMATICS

2:30 PM - 4:00 PM

SECTION B
(40 Marks)

Answer only TWO questions from this Section into the answer booklet.

1.

a.

i. Define the term *mathematical algorithm*. [2 marks]

ii. Describe, step by step, how you would use the 'HMMDIA' algorithm to explain the

operation $\begin{array}{r} 456 \\ -97 \\ \hline \end{array}$. [10 marks]

b. Describe four main features of the Babylonian numeration system. [8 marks]

2.

a.

i. What is meant by "*square root of a number*"? [3 marks]

ii. Explain how you would guide your students to use prime factorization to find the *square root of 784*. [8 marks]

b. Explain the following terms under transformation and illustrate each with a suitable example:

i. Translation [3 marks]

ii. Congruent figures [3 marks]

iii. Similar figures [3 marks]

3.

a. Identify and explain the assertions of the following personalities about mathematics:

i. Richard Skemp. [4 marks]

ii. Bertrand Russell. [4 marks]

b. Explain how you would determine the *abundant* and *deficient* numbers among the following numbers: 63, 48 and 30. [12 marks]

4.

a. Consider the pattern:

$$2 + 1 \times 9 = 11$$

$$3 + 12 \times 9 = 111$$

$$4 + 123 \times 9 = 1111$$

.....

.....

i. Predict the next three rows in the sequence. [6 marks]

ii. Complete the pattern to the 9th row in the sequence and explain the process involved. [8 marks]

b. Explain three main beliefs held by the absolutists philosophy of mathematics. [6 marks]