

APRIL 2022
EMA 402SW
TEACHING PROBLEM SOLVING IN
MATHEMATICS
1 HOUR 20 MINUTES

Candidate's Index Number

IE/MAT/AKR/190153

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 400, END-OF-FIRST SEMESTER EXAMINATIONS, APRIL 2022

APRIL 28, 2022

TEACHING PROBLEM SOLVING
IN MATHEMATICS

2:40 PM - 4:00 PM

SECTION B
[60 MARKS]

Answer any **TWO** questions from this section.

a. SECTION B [60 MARKS]

Answer **ANY TWO** questions from this section. Each question carries **30** marks.

1. a. Four terms of a sequence of Pythagorean triples can be represented as: (3, 4, 5), (5, 12, 13), (7, 24, 25), (9, 40, 41), ... ~~(4, 6, 8)~~
 - i. Write down the next **two** triples in this sequence. [6 marks]
 - ii. Find an expression for the r^{th} triple in this sequence. [8 marks]
 - iii. Find the tenth term of this sequence. [4 marks]
 - b. Show that the r^{th} term of the sequence 4, 12, 24, 40, ... of the second numbers of the triples is $2r(r+1)$. [6 marks]
 - c. With specific example in each case, differentiate between a *problem* and an *exercise*. [6 marks]
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2. Consider the series, (1) + (2 + 3) + (4 + 5 + 6) + (7 + 8 + 9 + 10) + (11 + 12 + 13 + 14 + 15) + ...
 - a. Find an expression for the i^{th} term in the r^{th} bracket [10 marks]
 - b. Given that 39×79 is the sum of all the numbers in the first k brackets in the series, find the value of k . [20 marks]

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2 HOURS

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E 1E/MAT/AKR/19/10/23
Signature: E. A. K.

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IN MATHEMATICS

2:00 PM - 2:40 PM

This paper consists of two sections, A and B. Answer ALL the questions in Section A and TWO questions from Section B. Section A will be collected after the first 40 minutes.

SECTION A
[40 MARKS]

Answer ALL the questions in this Section.

1. What is the *primary goal* of problem solving? [2 marks]
2. State the **two** main purposes that problems serve in mathematics. [4 marks]
3. Outline **two** values for teaching mathematics through problem solving. [4 marks]
4. Give **four** features of a problem in mathematics. [4 marks]
5. What does it mean to be successful at *Problem Solving*? [2 marks]
6. Outline **one** factor that determines the strategy to use in problem solving and investigations in mathematics. [4 marks]
7. The cost of a taxi fare (c) varies directly as the distance (d) traveled. When the distance is 60km the cost is GH¢35.00. Using John Mason's phases, find the cost when the distance is 95km. [10 marks]
8. The perimeter of a tennis court is 228 feet and the length is 6 feet longer than twice the width. Using George Polya's four principles of problem solving, what are the length and the width? [10 marks]