**HONG KONG DIPLOMA OF SECONDARY EDUCATION**

**EXAMINATION**

MATHEMATICS

Compulsory Part

**SCHOOL-BASED ASSESSMENT**

Sample Assessment Task

**How long is your shoelace?**

**Marking Guidelines**

The assessment scale for tasks on Problem-solving is shown in the following table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Level of performance | Marks | Mathematical Knowledge and Problem-solving Skills | Marks | Mathematical Communication Skills |
| Very good | 13 – 16 | The student demonstrates a complete understanding of the underlying mathematical knowledge and problem-solving skills which are relevant to the task, and is consistently competent and accurate in applying them in handling the task. Typically, the student is able to formulate a correct strategy, carry out the strategy and demonstrate a complete understanding of the significance and possible limitations of the results obtained. | 4 | The student communicates ideas in a clear, well organised and logically true manner through coherent written/verbal accounts, using appropriate and correct mathematical presentation to express, interpret and critically review the results obtained. |
| Good | 9 – 12 | The student demonstrates a substantial understanding of the underlying mathematical knowledge and problem-solving skills which are relevant to the task, and is generally competent and accurate in applying them in handling the task. Typically, the student is able to formulate a correct strategy and attempts to carry out the strategy for completing the task. | 3 | The student is able to communicate ideas properly through written/verbal accounts, using appropriate forms of mathematical presentation such as mathematical formulae or geometric facts. |
| Fair | 5 – 8 | The student demonstrates a basic understanding of the underlying mathematical knowledge and problem-solving skills which are relevant to the task, and is occasionally competent and accurate in applying them in handling the task. Typically, the student has a basic understanding of the task and is able to formulate a correct strategy for solving the task. | 2 | The student is able to communicate basic ideas with limited success in using appropriate mathematical terms and terminology. |
| Weak | 1 – 4 | The student demonstrates a limited understanding of the underlying mathematical knowledge and problem-solving skills which are relevant to the task, and is rarely competent and accurate in applying them in handling the task. Typically, the student has a bare understanding of the task and can only attempt to complete the simplest part of the task. | 1 | The student attempts to communicate ideas using some basic forms of mathematical presentation such as symbols, notations, diagrams, tables, graphs etc., but has little success in doing so. |

* The full mark of a SBA task on Problem-solving submitted should be scaled to 20 marks, of which 16 marks are awarded for the mathematical knowledge and problem-solving skills while 4 marks are awarded for the mathematical communication skills.
* Teachers should base on the above assessment scale to design SBA tasks for assessing students with different abilities and to develop the marking guidelines.

# Part A

Evidence:

Methods for lacing

Weak: Not able to give feasible lacing method

Fair: Able to provide one feasible lacing method

Good: Able to give 2 different and feasible lacing methods

1. Two different lacing methods are given below as an example.

Evidence:

The solution

Weak: Wrong working and answers

Fair: Correct working for one part

Good: Correct working and answer for one part

Very good: Correct working and answers for both parts

1. (a) 4! = 24

 (b) 6! / 2 = 360

**Part B**

Evidence:

The solutions

Weak: Wrong working and answers

Fair: Only one answer in (1) and the corresponding working are correct

Good: Only two answers in (1) and the corresponding working are correct

Very good: All answers and working in (1) and (2) are correct

1. Shoelace length for Criss-cross Lacing:

 

 Shoelace length for Straight Lacing:

 

 Shoelace length for Diagonal Straight Lacing:

 

2. For *w* = 5 cm , *d* = 1 cm and *l* = 3 cm , the shoelace length for

 (i) Criss-cross Lacing is approximately 62.0 cm

 (ii) Straight Lacing is approximately 54.5 cm

 (iii) Diagonal Straight Lacing is approximately 63.6 cm

 Hence, the Diagonal Straight Lacing requires the longest shoelace.

**Part C**

Evidence:

1. The method suggested

2. The shoelace length

Weak: The method suggested is not feasible

Fair: The method suggested is partly feasible

Good: The method suggested is feasible

Very good: The method suggested is feasible and the length of shoelace is correctly calculated

1. Two examples of the feasible lacing methods are given below:

|  |  |
| --- | --- |
| Cross Lacing | Lattice Lacing |

2. Shoelace length for Cross Lacing:

 

 Shoelace length for Lattice Lacing:

 