2. (a) Boyle's law states that the volume of a fixed mass of gas is inversely proportional to its pressure if the temperature is constant.

Students in a fifth form class were given the apparatus shown in Figure 1 and told to use it to investigate this law.
Label Figure 1 and describe how the investigation may be done.
Include ONE precaution that should be taken to keep the temperature constant.

(b) The students’ results were plotted on the graph shown in Figure 2.

![Figure 2](image)

Explain whether the graph shows that Boyle’s law is confirmed or not.

(c) If the students had plotted instead a graph of V against P, sketch the graph they would have obtained.

(10 marks)

(2 marks)

Total 16 marks
3. (a) Jamal and Kim were asked to demonstrate, using a magnet with unmarked poles, how they could distinguish the North Pole from the South Pole. Describe, with the aid of a diagram, a method they might have used.

Diagram(s):

Procedure:

(2 marks)

(4 marks)
Attempt ALL questions.

You MUST write your answers in this answer booklet.

1. A motor cyclist travels from St John's to the Vivian Richards Stadium in Antigua. His velocity was recorded at intervals for 60 s as shown in Table 1.

<table>
<thead>
<tr>
<th>Velocity, m/s²</th>
<th>0</th>
<th>8</th>
<th>14</th>
<th>29</th>
<th>30</th>
<th>37</th>
<th>45</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
</tr>
</tbody>
</table>

(a) On page 3, plot a graph of velocity versus time. (11 marks)

(b) One of the readings was incorrectly recorded. Identify this reading and write a possible value. (2 marks)

(c) Calculate the gradient of the graph. (6 marks)

(d) What physical quantity does the gradient represent? (1 mark)

END OF TEST

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.
READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. You MUST use this answer booklet when responding to the questions. For each question, write your answer in the space provided and return the answer booklet at the end of the examination.

2. ALL WORKING MUST BE SHOWN in this booklet, since marks will be awarded for correct steps in calculations.

3. Attempt ALL questions.

4. You may use a silent, non-programmable calculator.

5. Mathematical tables are provided.

6. You are advised to take some time to read through the paper and plan your answers.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

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01238032/JANUARY/F 2013
CANDIDATE'S RECEIPT

INSTRUCTIONS TO CANDIDATE:

1. Fill in all the information requested clearly and legibly.

TEST CODE

SUBJECT:

PROFICIENCY:

FULL NAME: [BLOCK LETTERS]

Signature:

Date:

2. Ensure that this slip is detached by the Supervisor or Invigilator and given to you when you hand in this booklet.

3. Keep it in a safe place until you have received your results.

INSTRUCTION TO SUPERVISOR/INVIGILATOR:

Sign the declaration below, detach this slip and hand it to the candidate as his/her receipt for this booklet collected by you.

I hereby acknowledge receipt of the candidate's booklet for the examination stated above.

Signature: ____________________________

Date: ____________________________

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CARIBBEAN SECONDARY EDUCATION CERTIFICATE®
ANSWER BOOKLET

17 JANUARY 2013 (p.m.)

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SUBJECT PHYSICS – Paper 032

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CANDIDATE'S FULL NAME

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