NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2013

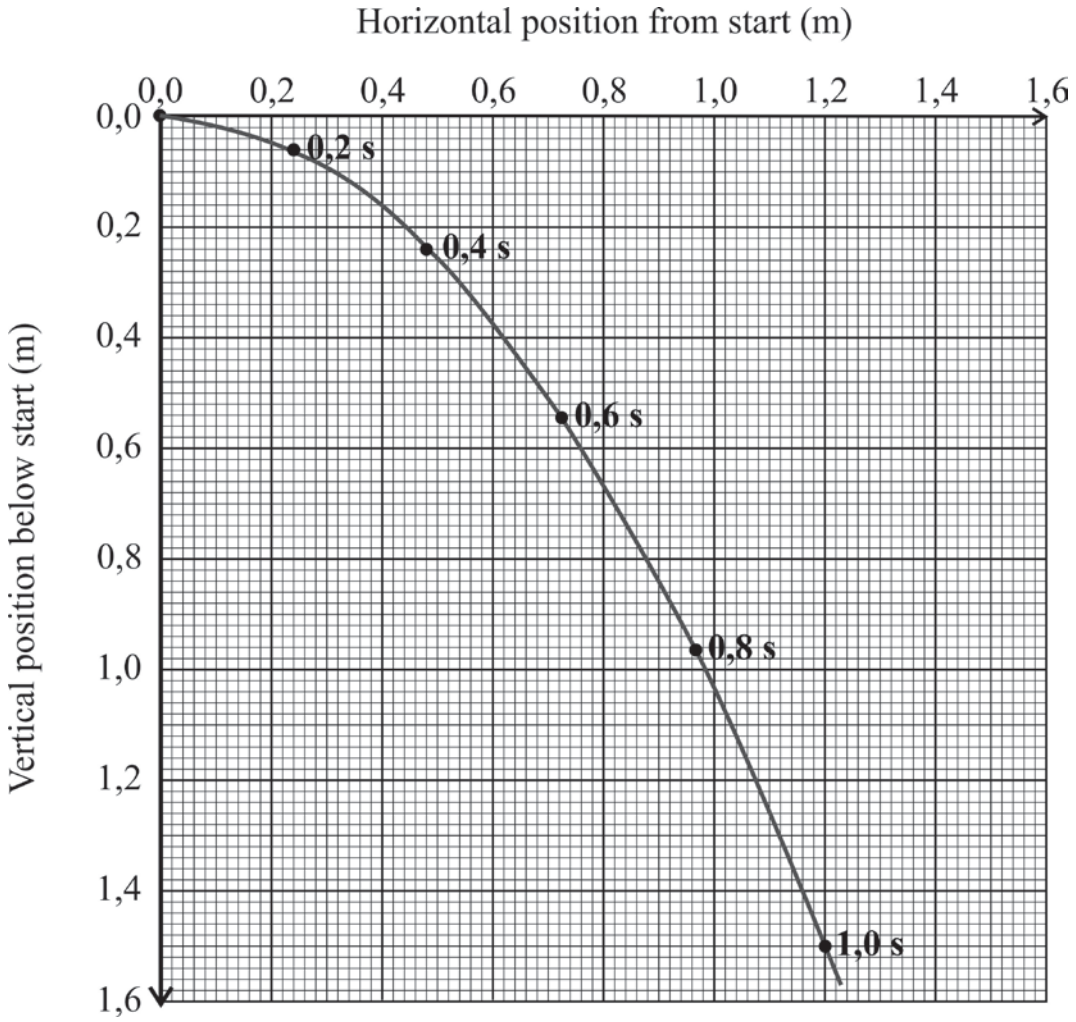
PHYSICAL SCIENCES: PAPER I

EXAMINATION NUMBER

ANSWER BOOKLET

QUESTION 3.2 PROJECTILE MOTION

Graph to show the relationship between the vertical and horizontal position of a stone projected horizontally from rest on an unknown planet. The time interval between consecutive points is 0,2 s.



3.2.1 Use the graph to complete Table 1 below.

Table 1

Time (s)	Horizontal position from start (m)	Vertical position below start (m)
0,0	0,00	0,00
0,2	0,24	0,06
0,4	0,48	
0,6	0,72	0,54
0,8	0,96	0,96
1,0		1,50

(4)

3.2.2 EXPLAIN how you can tell from the data that the horizontal component of the velocity of the stone remained constant throughout the motion.

(2)

3.2.3 Calculate the magnitude of the horizontal component of the velocity of the stone.

(3)

3.2.4 Complete Table 2 by calculating the vertical distance travelled by the stone during each of the time intervals given.

Table 2

Time interval (s)	0,0 – 0,2	0,2 – 0,4	0,4 – 0,6	0,6 – 0,8	0,8 – 1,0
Vertical distance (m)					

(5)

3.2.5 Use the data to explain how you can tell that the vertical acceleration of the stone was uniform.

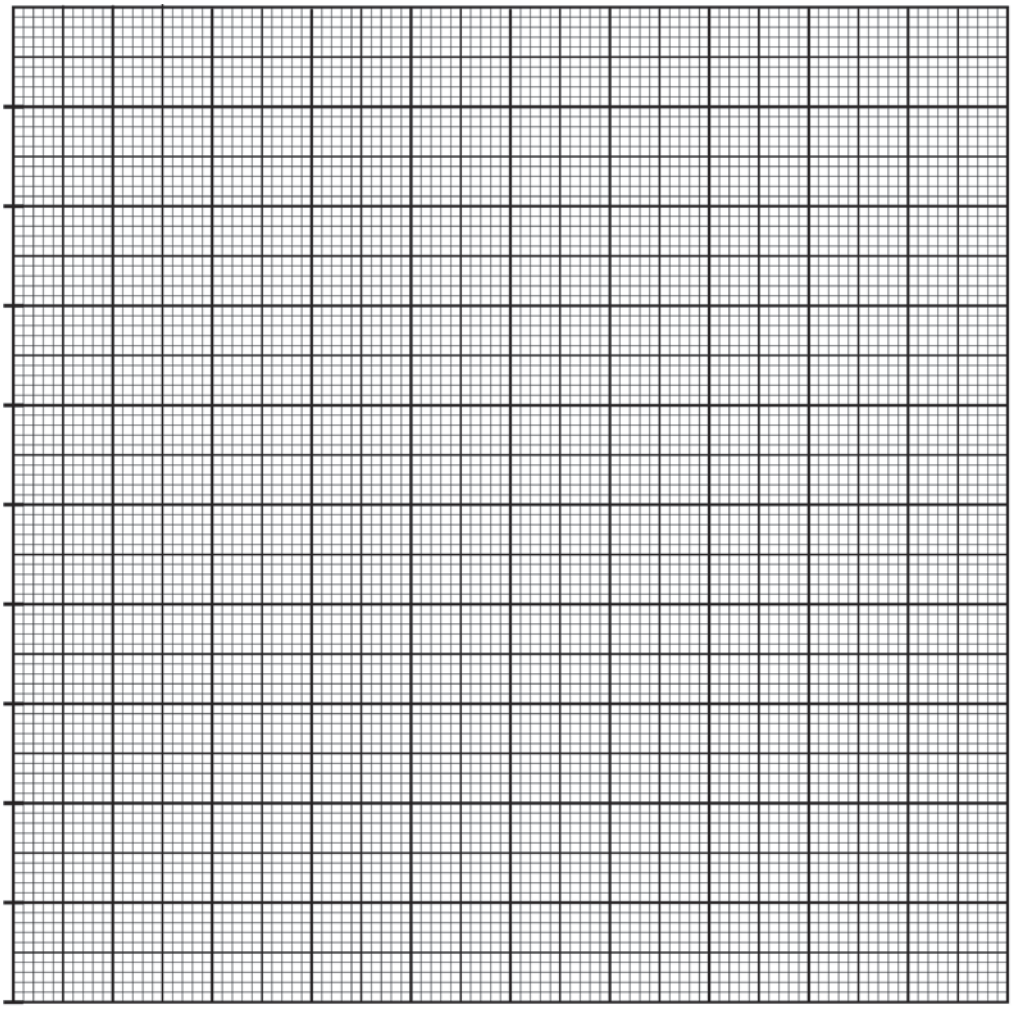
(4)

3.2.6 Calculate the magnitude of the acceleration due to gravity on this unknown planet.

(4)

3.2.7 On the same set of axes as given for the original graph draw an accurately plotted curve (show the points) to indicate how the graph would change if the magnitude of the initial velocity of the stone was half of its original velocity. Use the same time intervals as in the original graph. The stone was projected horizontally. (4)

QUESTION 4.1.3



(7)