

Past-paper walk-through

Displacement, Velocity, and Acceleration ■ 1.2

eXercise

Questions in this set

- 2023 Q2
- 2021 Q1
- 2021 Q3
- 2015 Q4

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

Question 2

2023 ■ Q2

[Figure: A cart on an inclined ramp. The ramp rises from lower right to upper left. At the top of the ramp, the origin $x = 0$ is marked with a small cart icon, and an arrow labeled $+x$ points down the incline (down and to the right) indicating the positive x -direction along the ramp's surface.]

Students conduct an experiment to determine the acceleration a of a cart. The cart is released from rest at time $t = 0$ and moves down the ramp. The x -axis is defined to be parallel to the ramp with its origin at the top, as shown in the figure. The students collect the data shown in the following table.

Position x (m)	Time t (s)
0.06	0.39
0.14	0.59
0.24	0.77
0.37	0.96
0.55	1.20

Question 2

(a)(i) Indicate which quantities could be graphed to yield a straight line whose slope could be used to determine the acceleration a of the cart. You may use the remaining columns in the table, as needed, to record any quantities (including units) that are not already in the table.

Vertical axis: _____ Horizontal axis: _____

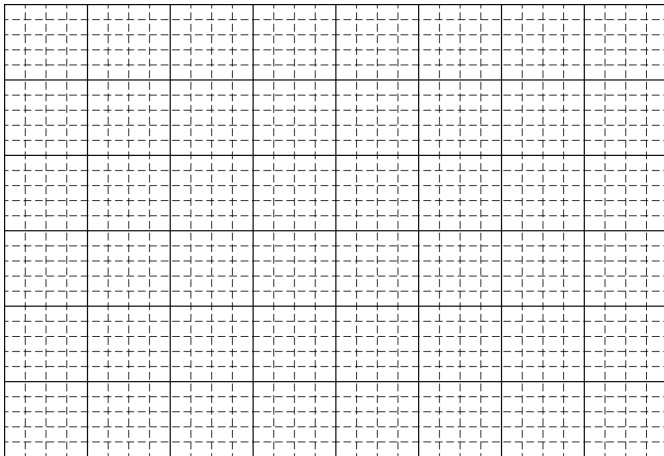
(a)(ii) [Continuation of Question 2.] On the following grid, plot the appropriate quantities to create a graph that can be used to determine the acceleration a of the cart as it rolls down the ramp. Clearly scale and label all axes (including units), as appropriate. Draw a straight line that best represents the data.

[Blank labeled grid for plotting, approximately 20 columns by 15 rows of light gridlines, no axes pre-drawn or pre-labeled.]

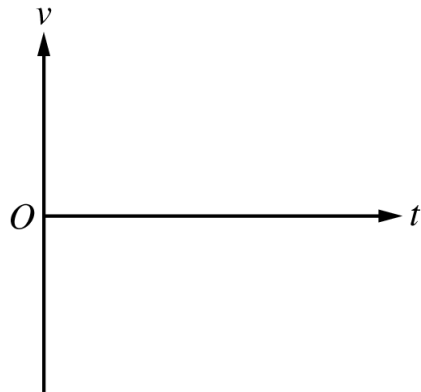
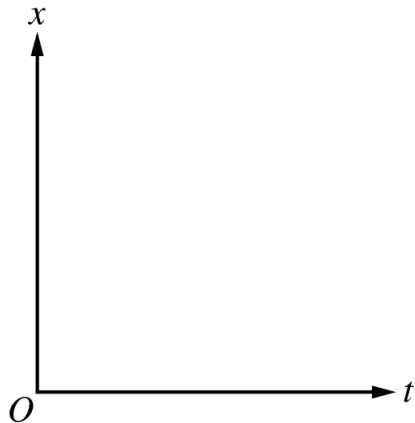
Question 2

(a)(iii) iii. Using the line you drew in part (a)(ii), calculate an experimental value for the acceleration a of the cart as it rolls down the ramp.

Question 2



Question 2



Question 2

