

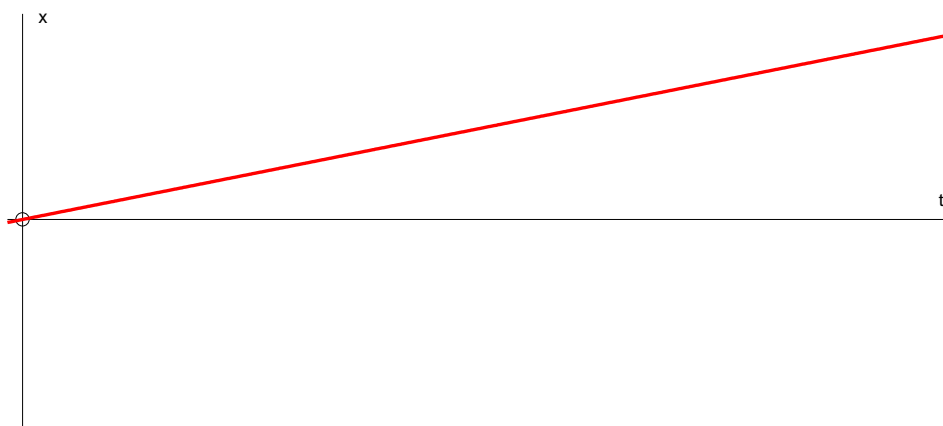
Motion graphs: Moving from constant to variable acceleration

Building upon prior knowledge and helping students to make connections with other areas of mathematics is crucial for students to make progress. Following their detailed study of motion involving constant acceleration students now need to be able to deal with variable acceleration. One way is to consider motion graphs which they have studied previously and to use these as a way in to thinking about variable acceleration.

This activity consists of 7 sets of motion graph axes (displacement-time, velocity-time, acceleration-time). In the first 6 sets the students are given one of the graphs and have to deduce the other two. They need to explain their reasoning and think about the initial conditions that would be appropriate for the scenario. They could also be asked to describe a 'real-life' scenario that could be modelled by the motion graphs they have worked on. The final set is just a set of blank axes which students could use to make up a question of their own to maybe give for their neighbour to attempt.

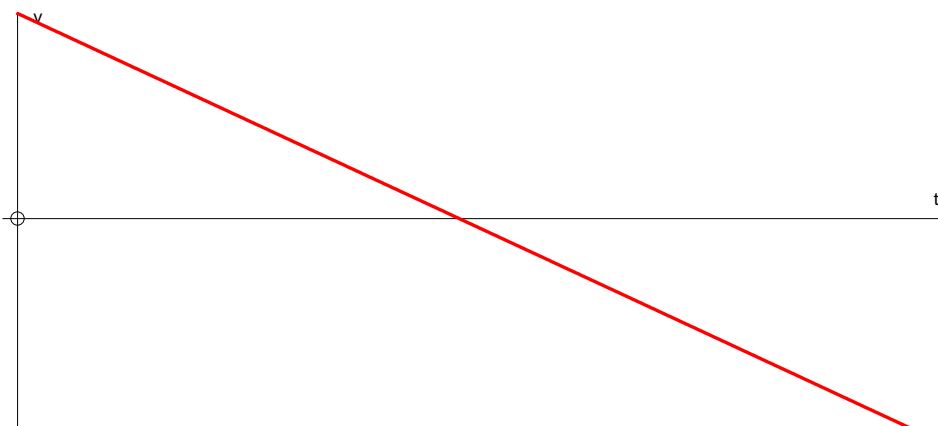
Graphs of displacement, velocity and acceleration against time 1

Given the graph of displacement against time, draw the other two graphs and label the axes appropriately. Carefully explain your reasoning. You might need to explain what initial conditions you have chosen.



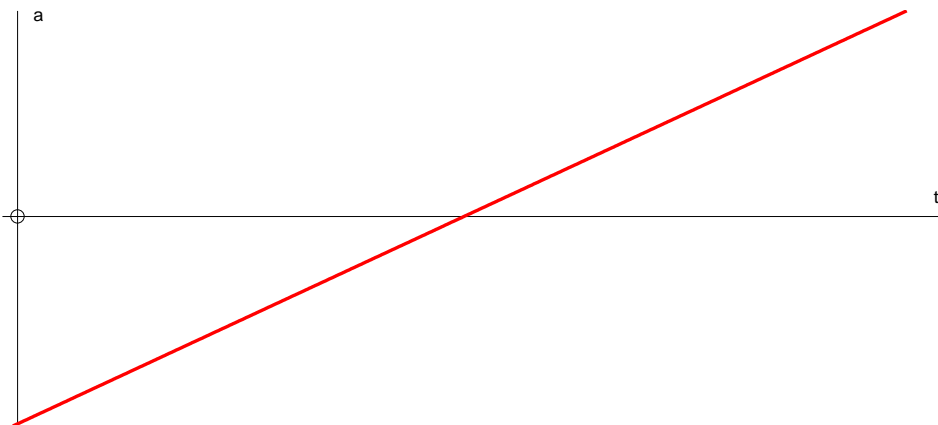
Graphs of displacement, velocity and acceleration against time 2

Given the graph of velocity against time, draw the other two graphs and label the axes appropriately. Carefully explain your reasoning. You might need to explain what initial conditions you have chosen.



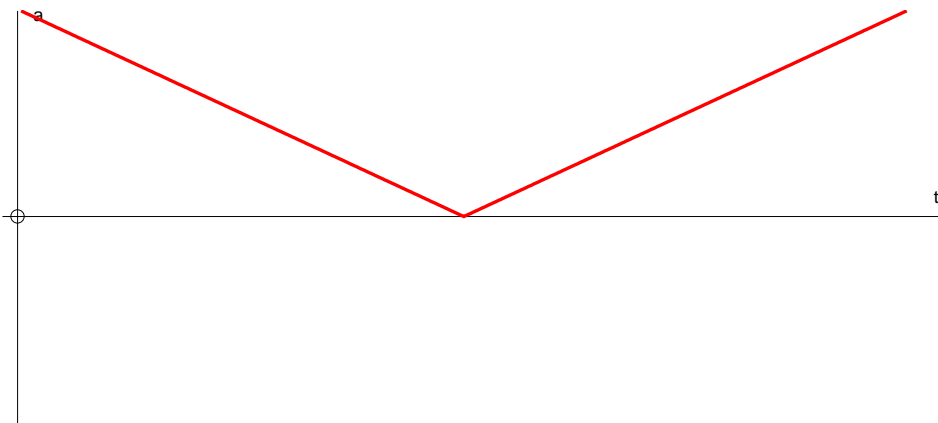
Graphs of displacement, velocity and acceleration against time 3

Given the graph of acceleration against time, draw the other two graphs and label the axes appropriately. Carefully explain your reasoning. You might need to explain what initial conditions you have chosen.



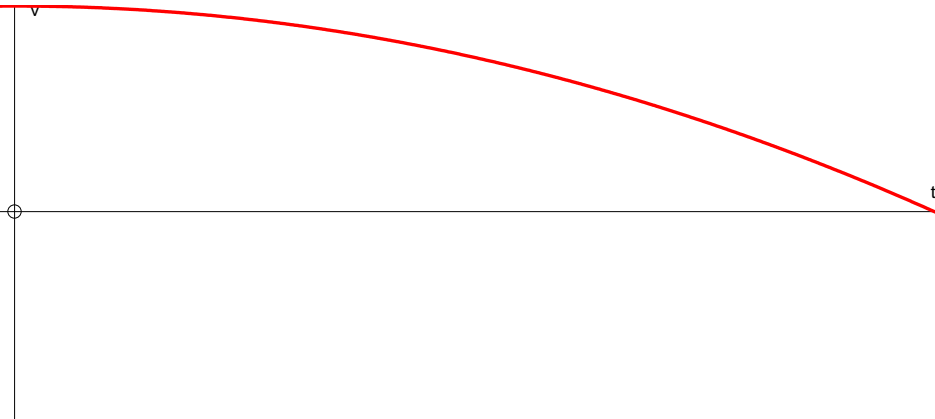
Graphs of displacement, velocity and acceleration against time 4

Given the graph of acceleration against time, draw the other two graphs and label the axes appropriately. Carefully explain your reasoning. You might need to explain what initial conditions you have chosen.



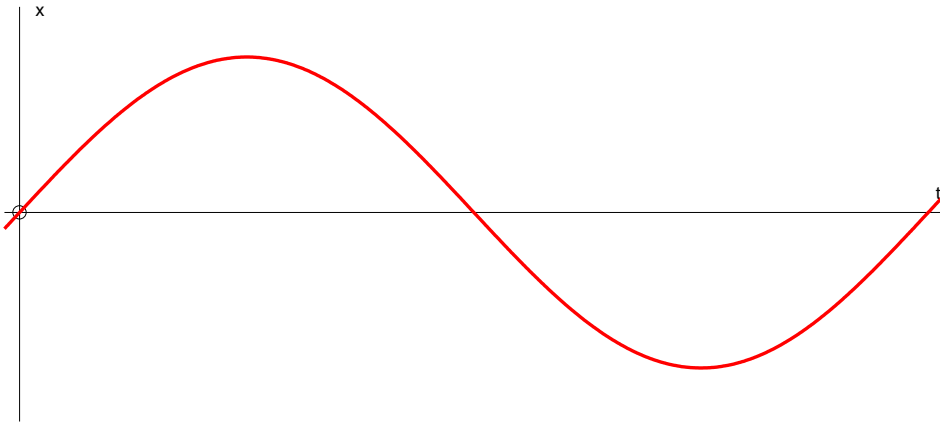
Graphs of displacement, velocity and acceleration against time 5

Given the graph of velocity against time, draw the other two graphs and label the axes appropriately. Carefully explain your reasoning. You might need to explain what initial conditions you have chosen.



Graphs of displacement, velocity and acceleration against time 6

Given the graph of displacement against time, draw the other two graphs and label the axes appropriately. Carefully explain your reasoning. You might need to explain what initial conditions you have chosen.



Graphs of displacement, velocity and acceleration against time

Now use this sheet to make one up for your neighbour.

