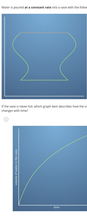
Congratulations! You passed!

Next Item

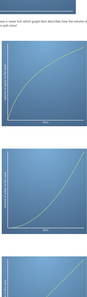
1. In this quiz you will get a refresher in functions - in particular, matching a description of a function to the graph of the function.

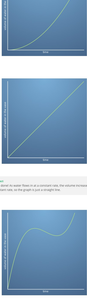
Grade: 100%

Water is poured **at a constant rate** into a vase with the following shape:



If the vase is never full, which graph best describes how the volume of water in the vase changes with time?



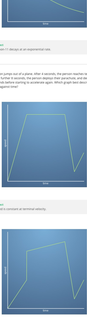


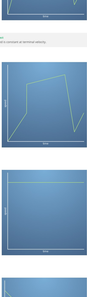
Correct

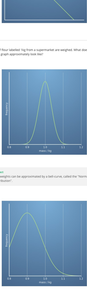
Well done! As water flows in at a constant rate, the volume increases at a constant rate, so the graph is just a straight line.

2. A sample of Carbon-11 has a half-life of approximately 20 minutes (that is, after 20 minutes, the mass of Carbon-11 remaining will have halved). If we start with a sample of 100g, which graph best describes how the mass of carbon-11 changes with time?

Grade: 100%





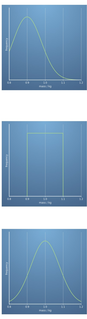


Correct

Carbon-11 decays at an exponential rate.

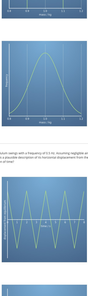
3. A person jumps out of a plane. After 4 seconds, the person reaches terminal velocity. Assuming the person's weight is constant and ignoring the effect of air resistance, which graph of a second before coming to a standstill, which graph best describes the person's velocity against time?

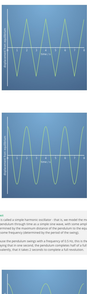
Grade: 100%

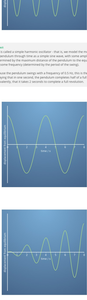


Correct

Speed is constant at terminal velocity.







4. Bags of flour labelled 1kg from a supermarket are weighed. What does the frequency weight graph approximately look like?

Grade: 100%

Correct

Weight distribution can be approximated by a bell curve, called the "Normal Distribution".

5. A pendulum swings with a frequency of 0.5 Hz. Assuming negligible air resistance, which graph is a precise description of its horizontal displacement from the equilibrium as a function of time?

Grade: 100%

Correct

This is called a simple harmonic oscillator - that is, we model the movement of the pendulum through time as a simple sine wave, with some amplitude (determined by the maximum distance of the pendulum to the equilibrium point), and a period (determined by the frequency of the pendulum).

Because the pendulum swings with a frequency of 0.5 Hz, this is the same thing as saying that in one second, the pendulum completes half of a full cycle, or equivalently, that it takes 2 seconds to complete a full revolution.