Module 02-Lesson 4

From Acceleration to Velocity and from Velocity to Displacement

Question 1: A little cat is running up a hill along a straight line along the x-axis. The cat starts slowing down as she gets tired according to the velocity-time graph shown in Fig. 1. What is the distance travelled by the cat between $t = 2$ s and $t = 6$ s?
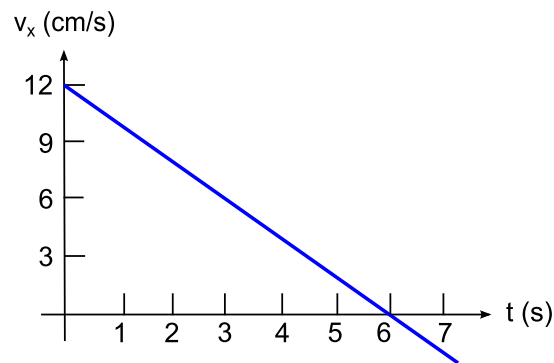

FIG. 1: A cat's velocity-time graph

Question 2: A particle starts from rest and accelerates according to the acceleration-time graph shown in Fig. 2. Determine the particle's speed at $t = 10.0$ s and at $t = 20.0$ s.
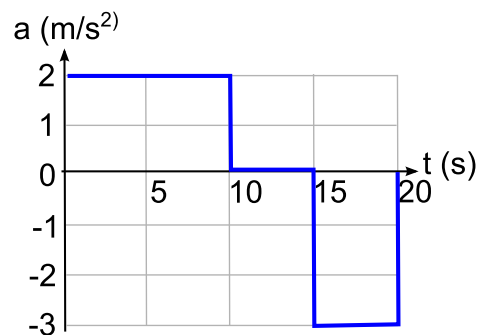

FIG. 2: A particle's acceleration-time graph

Problem: A car is driving through a green light at $t = 0$ located at $x = 0$ with an initial speed of 12 m/s. The acceleration of the car is zero for 1 second, and then the car accelerates at -6 m/s^2 for the next 2 seconds. Find the velocity and position of the car as

functions of time, and draw acceleration-time, velocity-time, and position-time graphs for the motion of the car.