

Module 01 - Lesson 5

Kinematics in One Dimension

Question 1: A ball rolls on an inclined surface. At a given time the position, velocity, and acceleration of the ball are given by $s = +3$ m, $v_s = -2$ m/s, and $a_s = +5$ m/s², respectively. Is the ball slowing down, speeding up, or moving with constant speed?

Question 2: A ball is moving from left to right on the horizontal, as shown in a flash strobe diagram in Fig. 1. The flash strobe photographs were taken every second.

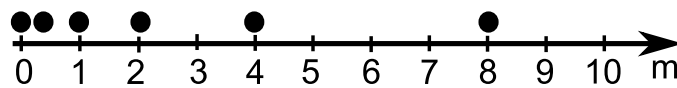


FIG. 1: Flash strobe diagram of a moving ball.

(a) Measure the x-value of the ball at each dot. List your data in a table, showing each position and the time at which it occurred.

(b) Make a position-versus-time graph for the moving ball.

Problem: Two toy rockets are travelling in the same direction. A diagram of strobe pictures are shown in Fig. 2. (a) At what time(s) do the rockets have the same velocity? (b) At what time(s) do the rockets have the same position? (c) At what time(s) do the two rockets have the same acceleration?

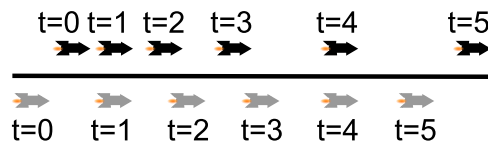


FIG. 2: A strobe photo of two toy rockets.