# Question #342

The setup below uses a *Vernier Software and Technology* ultrasonic ranger with the computer seen at the right in the photograph to make graphs of my motion. The ultrasonic ranger measures the time taken for a short burst of ultrasound emitted by the source to reflect off the styrofoam block which I am holding, and return to the source, which also acts as a detector. That time is converted into a distance by the computer and plotted by the *Vernier Software* program. The motion detector is a small black object at the nearest corner of the blue table holding the computer and monitor. The numbers on the sheets of white paper give the distance in meters from the ultrasonic range finder. The electronic box above the "0 meter" marker is an electronic timer that measures elapsed time for the motion, in seconds; the green "0" represents 0 seconds.
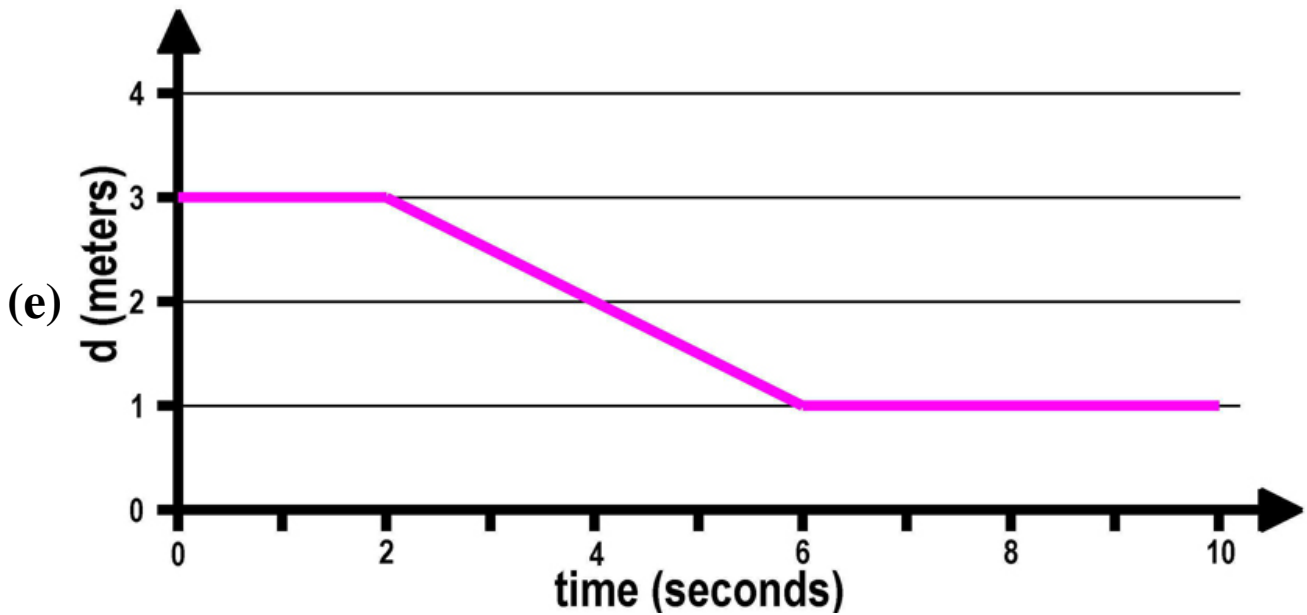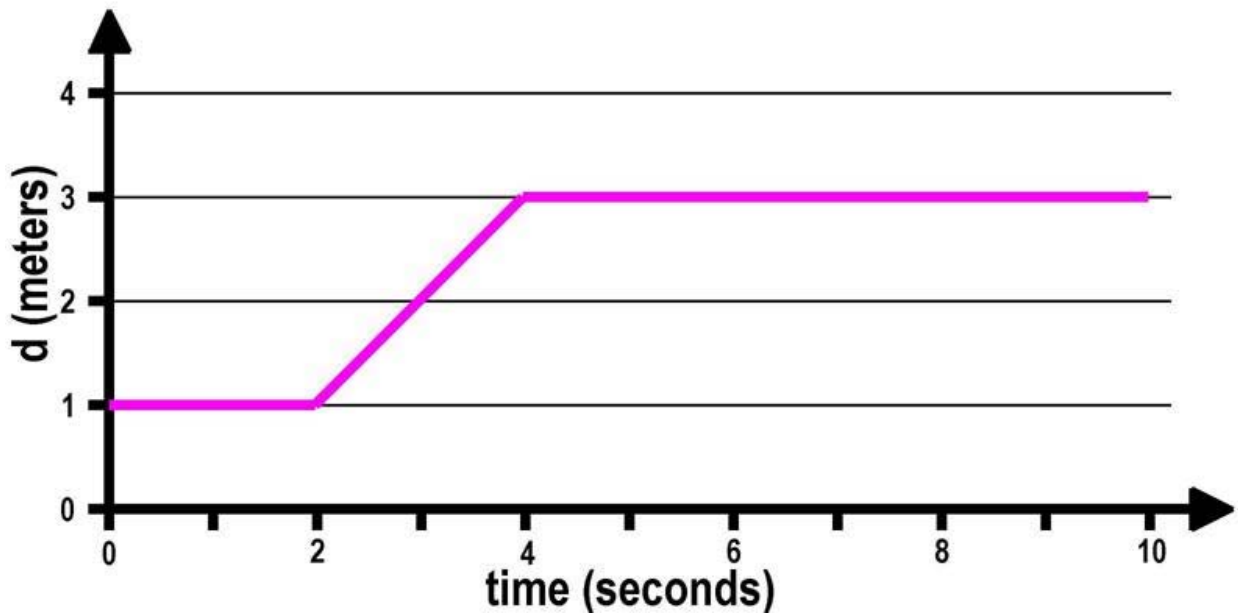

Shown below are five graphs of d(t) versus t, where t is the time in seconds and d(t) is the distance from the pulsed ultrasonic range detector.

(a)

(b)

(c)

(d)

(e)
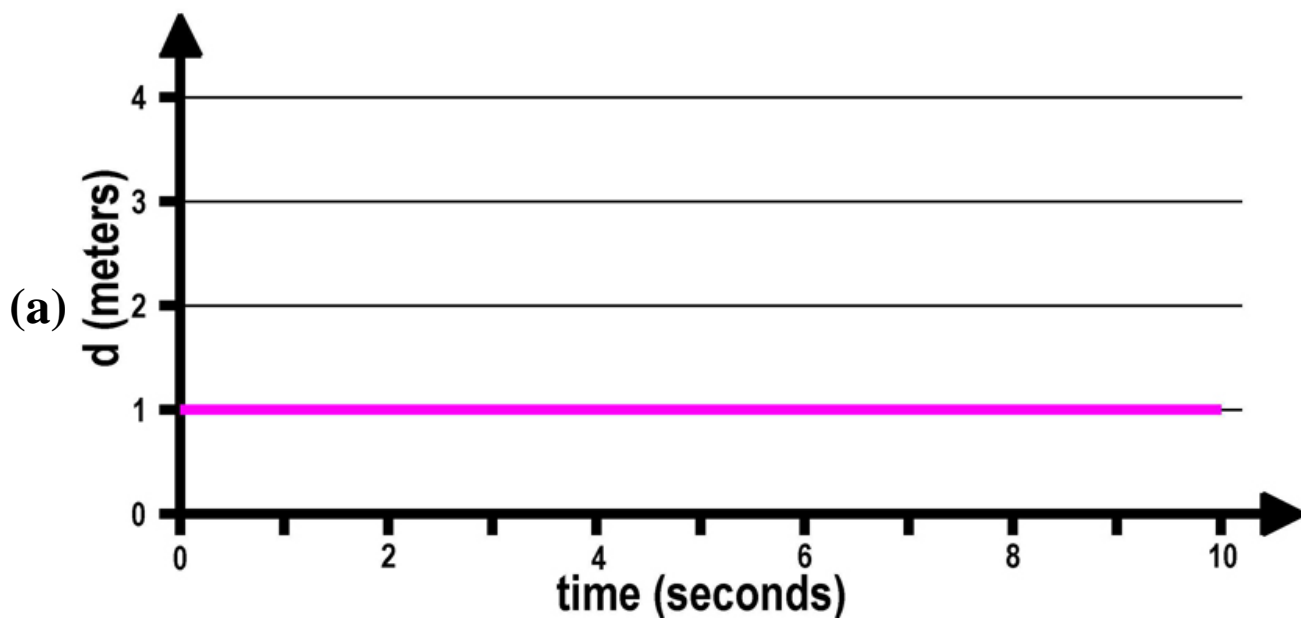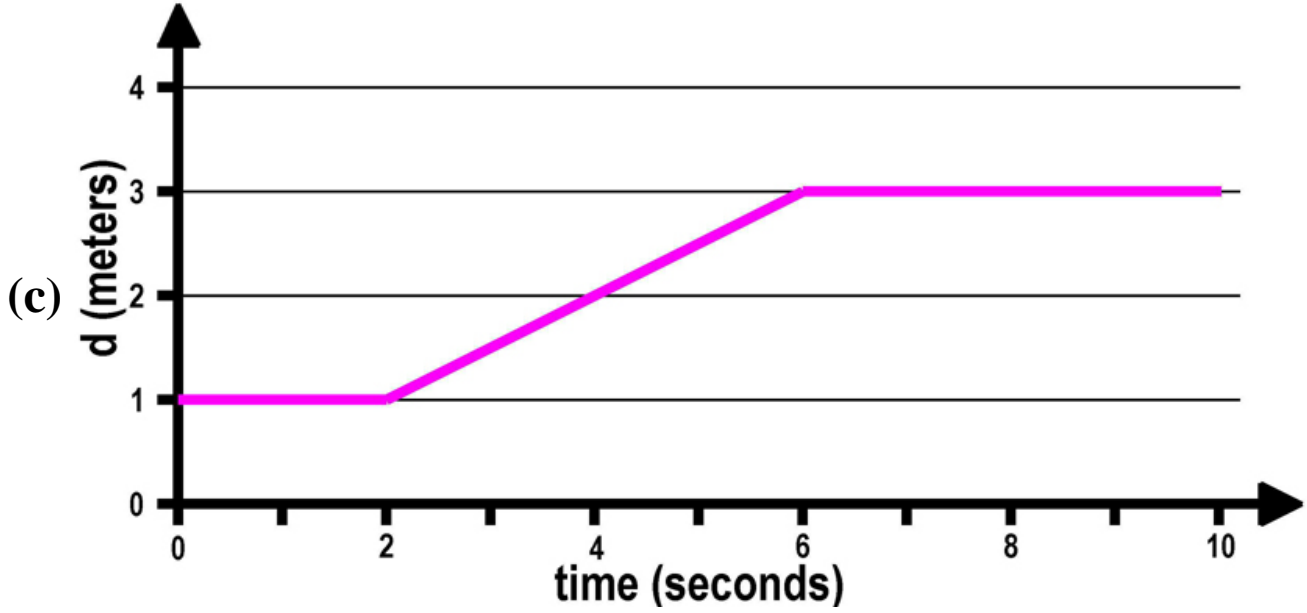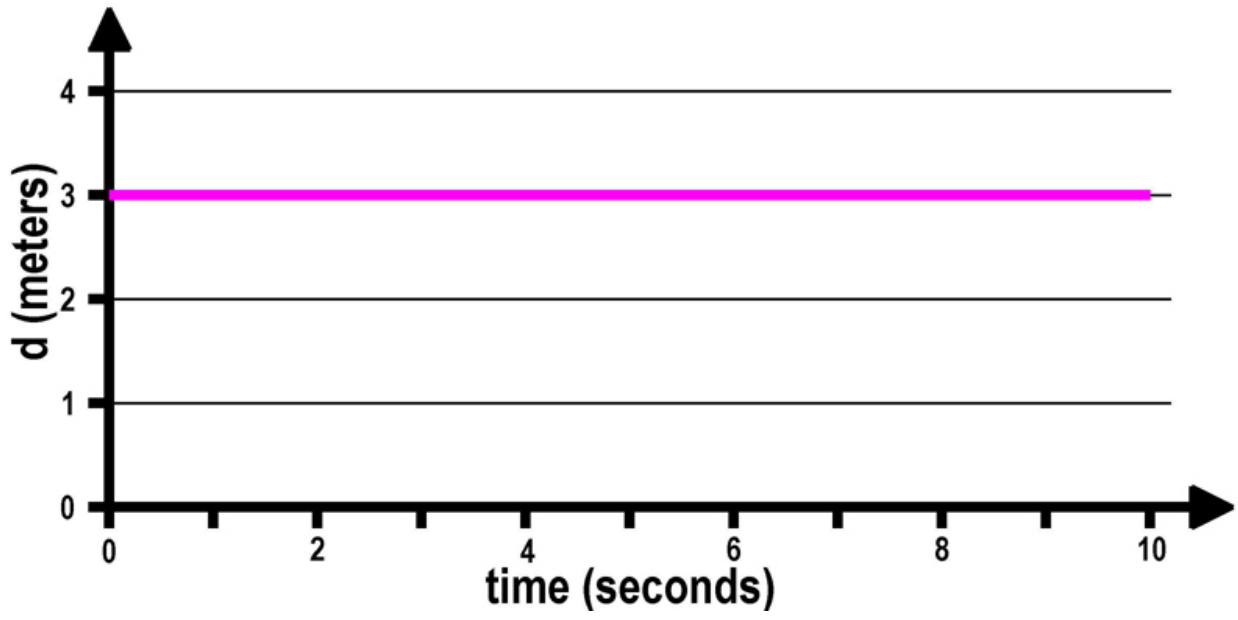
The eight links below include examples of position versus time that I will create by moving back and forth across the stage in front of the large numbers that represent the distance of the foam block from the detector. These motions may or may not be the motion described by the five graphs above. You are to correlate my whereabouts as seen in the videos below with the five graphs above.

Links to the motion videos are:

- Video #1
- Video #2
- Video #3
- Video #4
- Video #5
- Video #6
- Video #7
- Video #8

My correlations are (print and mark your answers on the table):

- (a) Video #1, 2, 3, 4, 5, 6, 7, 8.
- (b) Video #1, 2, 3, 4, 5, 6, 7, 8.

- (c) Video #1, 2, 3, 4, 5, 6, 7, 8.
- (d) Video #1, 2, 3, 4, 5, 6, 7, 8.
- (e) Video #1, 2, 3, 4, 5, 6, 7, 8.

Click here for Answer #342 after April 6, 2009.

Question of the Week

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