

ave. = 7.6
 $\sigma = 1.9$

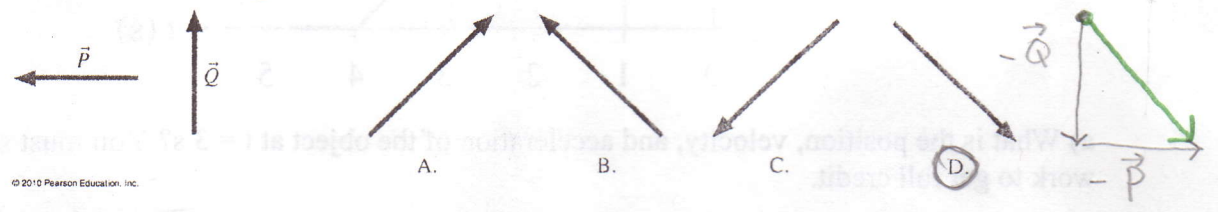
Quiz #1: Concepts of Motion and Kinematics in One Dimension

Problem 1 (2 points)

\vec{P} and \vec{Q} are two vectors of equal lengths but different directions as shown in the figure below.

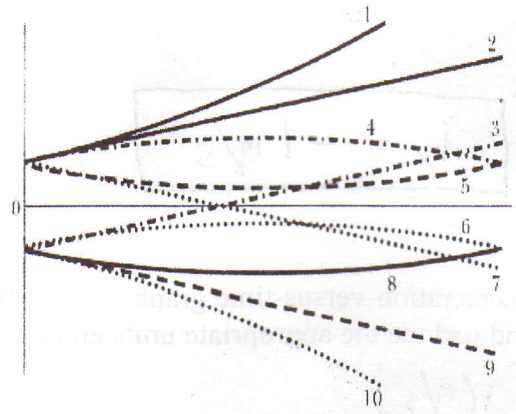
Which vector best describes $-\vec{Q} - \vec{P}$?

D



Problem 2 (3 points)

In the figure below, assume that the vertical axis plots the *velocity* v of an object moving along an x -axis as a function of time.



Situation	a	b	c	d
Initial x (m)	+10	-10	+10	-10
Initial v (m/s)	+5	-5	-5	+5
Constant a (m/s ²)	+2	-2	+2	-2

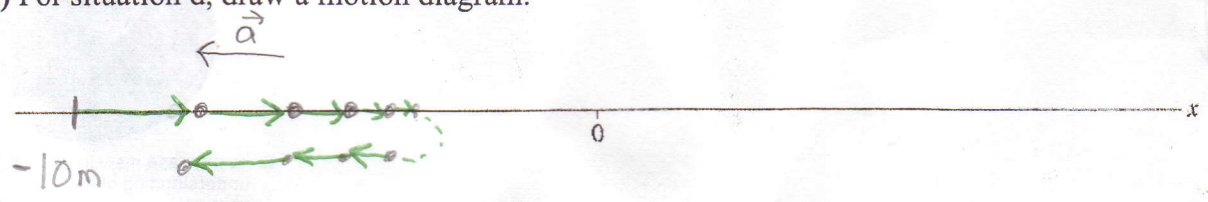
a) Determine which of the 10 plots of v versus time t best describes the motion for the four situations listed in the table above. (Note: plots 2, 3, 7, and 9 are straight; the others are curved.)

Situation a: 2 Situation c: 3
 Situation b: 9 Situation d: 7

b) If, instead, the vertical axis plots the *position* x of the object as a function of time, which of the 10 plots best describes the motion for the four situations given in the table.

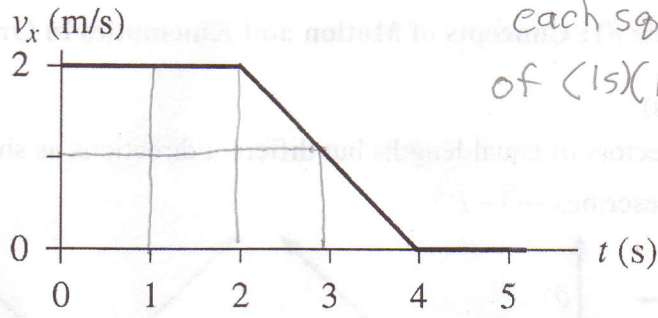
Situation a: 1 Situation c: 5
 Situation b: 10 Situation d: 6

c) For situation d, draw a motion diagram.



Problem 3 (5 points)

The velocity-versus-time graph for an object moving along an x-axis is shown below. The initial position of the object is $x_0 = -2.0$ m.



each square has area of $(1s)(1m/s) = 1m$

a) What is the position, velocity, and acceleration of the object at $t = 3$ s? You must show all of your work to get full credit.

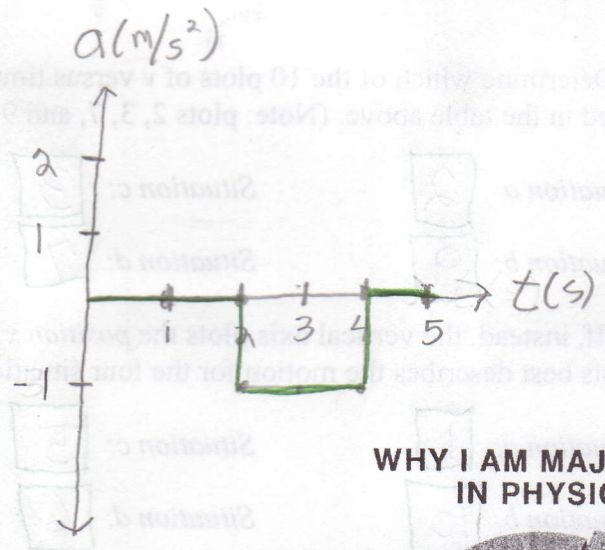
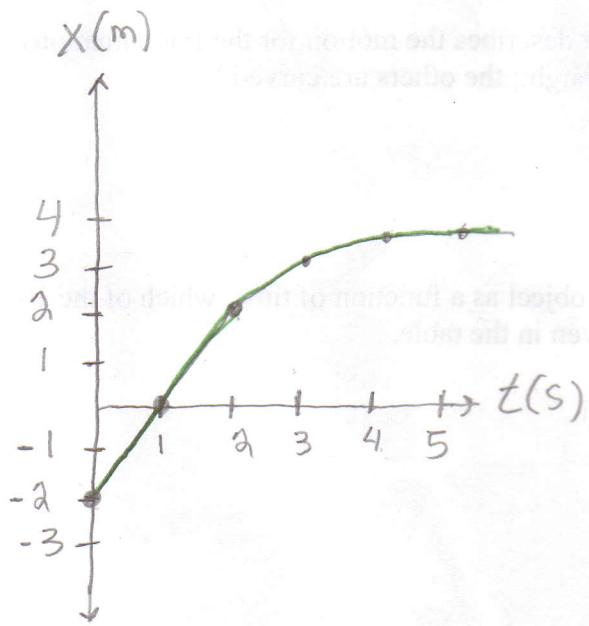
$$X_f = X_i + \Delta X = X_i + \text{area under curve} = -2.0m + 5.5(1m)$$

$$X_f = +3.5m$$

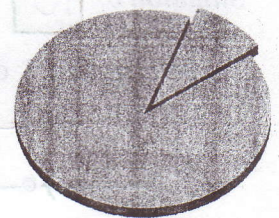
$$V_x = 1m/s \text{ (right from graph)}$$

$$a_x = \frac{\Delta V_x}{\Delta t} = \frac{0m/s - 2m/s}{4s - 2s} \rightarrow a_x = -1m/s^2$$

b) Draw a detailed position-versus-time graph and acceleration-versus-time graph for the object's motion. For each graph, be sure to label your axes and include the appropriate units and values.



WHY I AM MAJORING IN PHYSICS



- To increase mankind's understanding of the universe
- To figure out how to build a lightsaber