

Ch1 HW2 (1360578)

Current Score: 0/20 Due: Thu Sep 2 2010 09:00 AM EDT

Question	1	2	3	4	5	6	7	8	Total
Points	0/1	0/1	0/1	0/1	0/5	0/3	0/1	0/7	0/20

Description

Interactions; Average velocity; Position update



Instructions

Reading: Sec. 1.2-1.4, 1.7

1. 0/1 points

MI3 1.3.X.004. [1249716]



A spaceship far from all other objects uses its impulse power system to attain a speed of 10^4 m/s. The crew then shuts off the power. According to Newton's first law, what will happen to the motion of the spaceship from then on? (Select all that apply.)

- The spaceship will enter a circular orbit.
- The spaceship will travel on a curving path.
-  The spaceship will move in a straight line.
- The spaceship will gradually slow down.
-  The speed of the spaceship will not change.
- The spaceship will stop suddenly.

2. 0/1 points

MI3 1.4.X.005. [1249702]

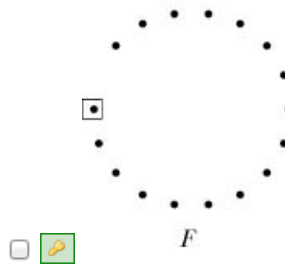
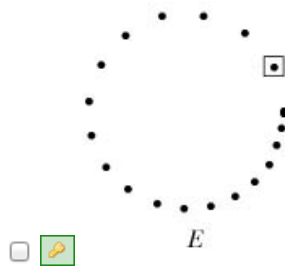
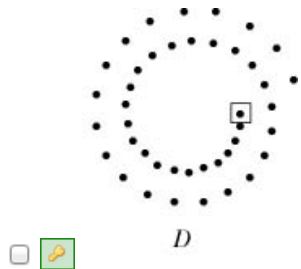
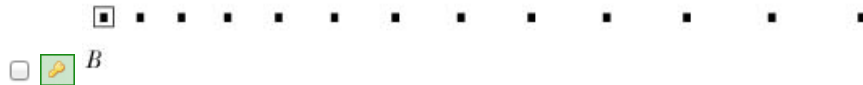
You slide a coin across the floor, and observe that it slows down and eventually stops. A sensitive thermometer shows that its temperature increased. What can we conclude? (Select all that apply.)

-  Because the coin got hot, we conclude that it interacted with one or more other objects.
-  Because the coin's speed changed, we conclude that it interacted with one or more other objects.
- Because the coin traveled in a straight line, we conclude that it did not interact with anything.
- Because the coin did not change shape, we conclude that it did not interact with anything.
- Because the coin slowed down, we conclude that Newton's first law does not apply to objects in everyday life, such as coins.

3. 0/1 points

MI3 1.2.X.048. [1250558]

Moving objects left the traces labeled *A - F*. The dots were deposited at equal time intervals (for example, one dot each second). Which trajectories show evidence that the moving object was interacting with another object somewhere? In each case the object starts from the square.



4. 0/1 points

MI3 1.2.X.047. [1250550]

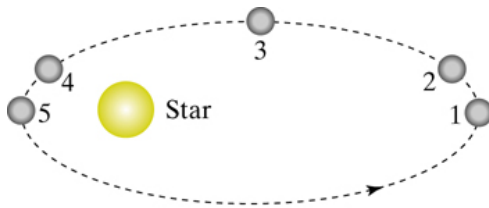
Which of the following observations represent conclusive evidence of an interaction? (Select all that apply.)

- change of position without change of velocity
- change of identity without change of velocity
- change of direction without change of speed
- change of temperature without change of velocity
- change of shape or configuration without change of velocity

5. 0/5 points

mi3 1.7.x.034.nva [1249704]

A comet travels in an elliptical path around a star, in the direction shown in the diagram. Which arrow best indicates the direction of the comet's velocity vector at each of the following locations in the orbit?



- Location 1: a
- Location 2: h
- Location 3: g
- Location 4: f
- Location 5: e

6. 0/3 points

MI3 1.7.X.091. [1249673]

At time $t_1 = 14$ s, a car is located at $\langle 88, 70, 23 \rangle$ m and has velocity $\langle 4, 0, -3 \rangle$ m/s.


At time $t_2 = 20$ s, what is the position of the car? (The velocity is constant in magnitude and direction during this time interval.)

position = \langle 112 $,$ 70 $,$ 5 \rangle m

7. 0/1 points

MI3 1.7.X.092. [1249667]

At a certain instant a ball passes location $\langle 6, 22, -14 \rangle$ m. In the next 3 seconds, the ball's average velocity is $\langle -7, 38, 25 \rangle$ m/s. At the end of this 3 second time interval, what is the height y of the ball?

$y =$  136 m



8. 0/7 points

MI2 01.X.41.02 [624102]



Here are the positions at three different times for a bee in flight (a bee's top speed is about 7 m/s).

time	3.8 s	4.3 s	4.8 s
position	$\langle 3.4, 3.3, 0 \rangle$ m	$\langle 0.6, 7, 0 \rangle$ m	$\langle -1.4, 12.6, 0 \rangle$ m


(a) Between 3.8 s and 4.3 s, what was the bee's average velocity? Be careful with signs.

$(\vec{v})_{\text{avg},a} = \langle$  -5.6 ,  7.4 , 0 \rangle m/s



(b) Between 3.8 s and 4.8 s, what was the bee's average velocity? Be careful with signs.

$(\vec{v})_{\text{avg},b} = \langle$  -4.8 ,  9.3 , 0 \rangle m/s

(c) Of the two average velocities you calculated, which is the best estimate of the bee's instantaneous velocity at time 3.8 s?

 a

(d) Using the best information available, what was the displacement of the bee during the time interval from 3.8 s to 3.82 s?

$\Delta \vec{r} = \langle$  -0.112 ,  0.148 , 0 \rangle m

Assignment Details