WebAssign
CH01-HW02-SP12 (Homework)

Yinglai Wang
PHYS 172-SPRING 2012, Spring 2012
Instructor: Virendra Saxena

Current Score : 23 / 23 **Due :** Tuesday, January 17 2012 11:59 PM EST

The due date for this assignment is past. Your work can be viewed below, but no changes can be made.

Important! Before you view the answer key, decide whether or not you plan to request an extension. Your Instructor may *not* grant you an extension if you have viewed the answer key. Automatic extensions are not granted if you have viewed the answer key.

View Key

1. 1/1 points | Previous Answers MI3 1.3.X.004

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.)

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

- *Read the eBook*
- Section 1.3

2. 1/1 points | Previous Answers MI3 1.4.X.005

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.)

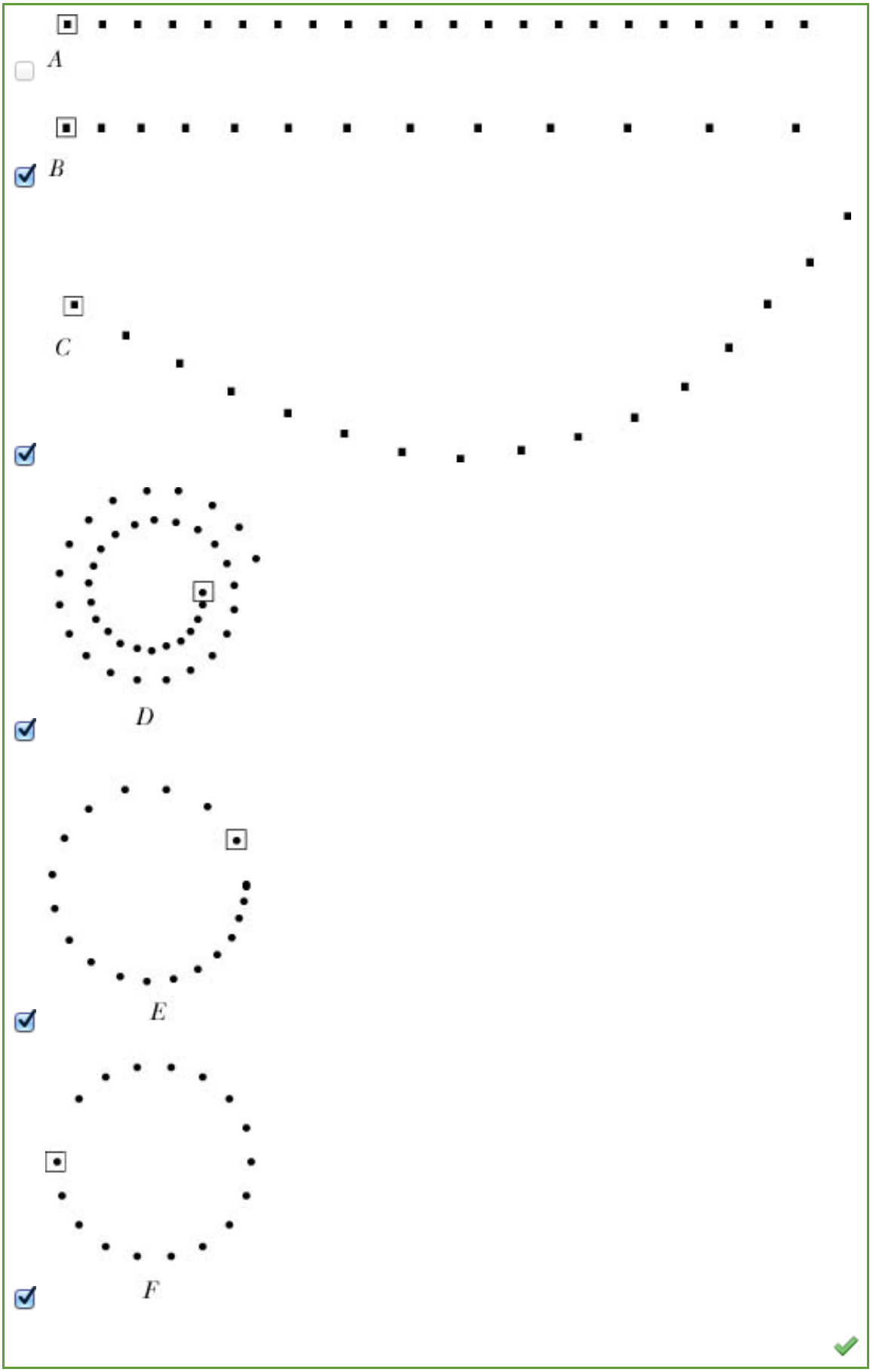
- [ ] Because the coin did not change shape, we conclude that it did not interact with anything.
- [x] Because the coin got hot, we conclude that it interacted with one or more other objects.
- [ ] Because the coin slowed down, we conclude that Newton's first law does not apply to objects in everyday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

- *Read the eBook*
- Section 1.4

---

3. 1/1 points | Previous Answers MI3 1.2.X.048

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.



- *Read the eBook*

- Section 1.2

---

4. 1/1 points | Previous Answers MI3 1.2.X.047

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

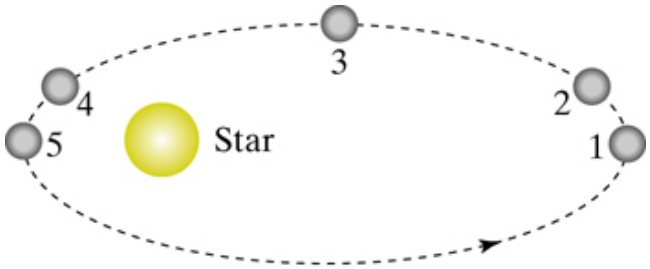
- [x] change of shape or configuration without change of velocity
- [ ] change of position without change of velocity
- [x] change of identity without change of velocity
- [x] change of direction without change of speed
- [x] change of temperature without change of velocity

- *Read the eBook*
- Section 1.2

---

5. 5/5 points | Previous Answers MI3 1.7.X.034

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?



j zero magnitude

Location 1: a
Location 2: h
Location 3: g

Location 4: f
Location 5: e

- *Read the eBook*
- Section 1.7

---

6. 3/3 points | Previous Answers MI3 1.7.X.030

A spacecraft is observed to be at a location < 200, 300, -400 > m relative to an origin located on a nearby asteroid, and 5 seconds later is observed to be at location < 320, 0, -535 >.

(a) What is the average velocity of the spacecraft during this interval?
$\vec{v}_{avg}$ = m/s

(b) What is the average speed of the spacecraft during this period?
$|\vec{v}_{avg}|$ = 70.04 m/s

(c) What is the unit vector in the direction of the average velocity?
$\hat{v}$ =

- *Read the eBook*
- Section 1.7

---

7. 3/3 points | Previous Answers MI3 1.7.X.091

At time t_1 = 14 s, a car is located at < 120, 80, 24 > m and has velocity < 6, 0, -3 > m/s.

At time t_2 = 18 s, what is the position of the car? (The velocity is constant in magnitude and direction during this time interval.)
position = < 144 , 80 , 12 > m

- *Read the eBook*
- Section 1.7

---

8. 1/1 points | Previous Answers MI3 1.7.X.092

At a certain instant a ball passes location < 8, 19, -16 > m. In the next 3 seconds, the ball's average velocity is < -3, 26, 14 > m/s. At the end of this 3 second time interval, what is the height *y* of the ball?
y = 97 m

- *Read the eBook*
- Section 1.7

---

9. 7/7 points | Previous Answers MI2 01.X.41.02

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

time	4.4 s	4.7 s	5 s
position	< 2.6, 4.3, 0 > m	< 0.8, 6.9, 0 > m	< -0.5, 10.3, 0 > m

(a) Between 4.4 s and 4.7 s, what was the bee's average velocity? Be careful with signs.

= < -6 , 8.67 , 0 > m/s

(b) Between 4.4 s and 5 s, what was the bee's average velocity? Be careful with signs.

= < -5.17 , 10 , 0 > m/s

(c) Of the two average velocities you calculated, which is the best estimate of the bee's instantaneous velocity at time 4.4 s?

a

(d) Using the best information available, what was the displacement of the bee during the time interval from 4.4 s to 4.44 s?

= < -0.24 , 0.3468 , 0 > m