

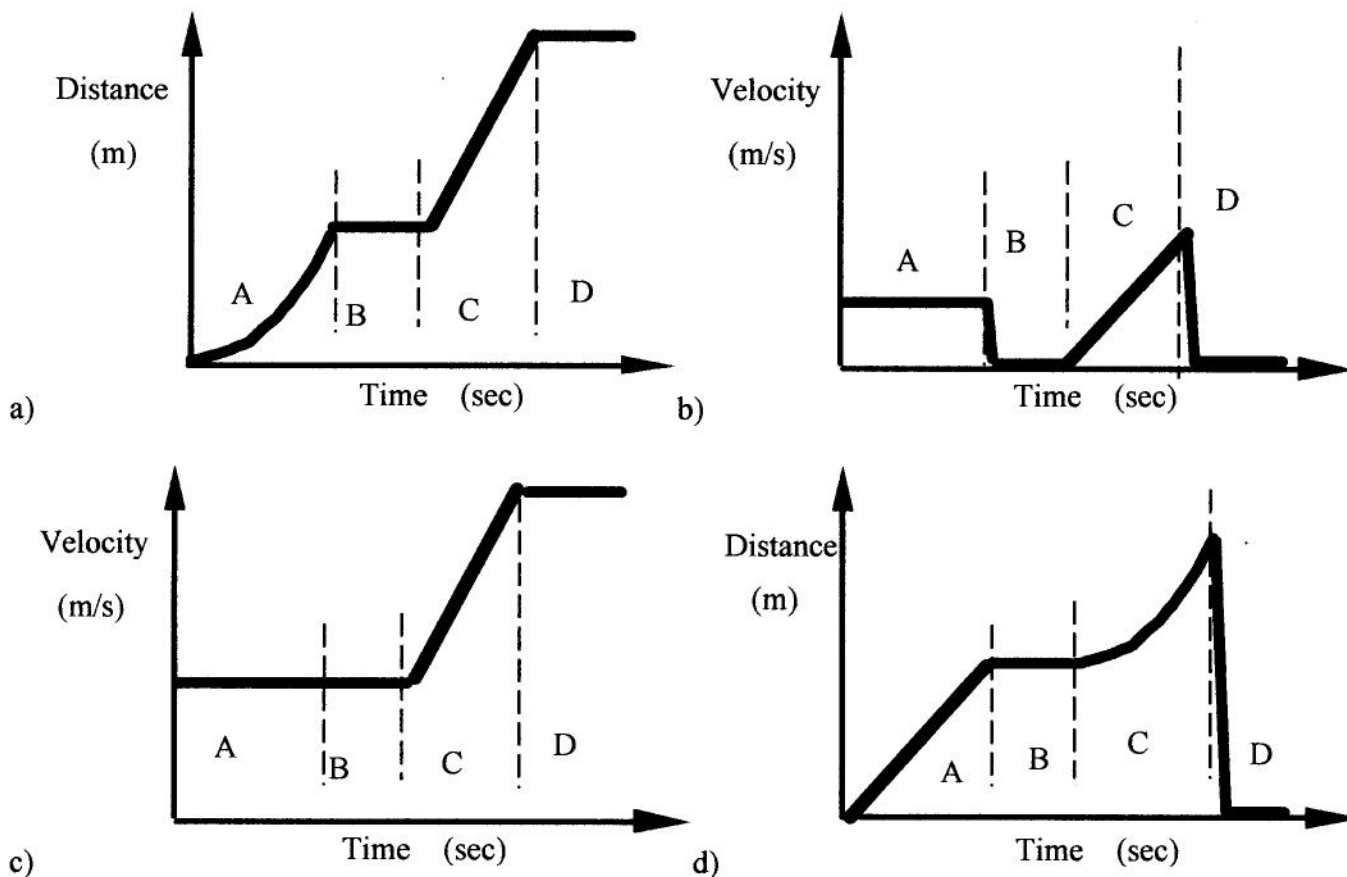
1.) In a classroom demonstration, a book and a piece of paper were dropped at the same time from the same height. When the paper was flat, we observed that _____ and when the paper was rolled into a ball, we saw that _____.

- a) both fell together, the paper landed first
- b) the book landed first both times
- c) the book landed first, the paper landed first
- d) they both fell together both times
- e) the book landed first, they both fell together

2.) A car stopped to turn the corner onto Spring Street and then accelerated for 8 seconds. If the car accelerated at 0.3 m/s^2 , how far did it travel during its acceleration ?

- a) 9.6 meters
- b) 19.2 meters
- c) 1.2 meters
- d) 2.4 meters
- e) 313.6 meters

3.) Choose the graph which BEST describes the motion of the following example. A. A fox trots steadily across the meadow B. It stops as it catches the delicate and delicious aroma of rabbit! C. When the rabbit stops to eat some clover, the fox runs across the meadow picking up speed until it reaches the cowering rabbit where (D.) it stops as the rabbit jumps down its hole

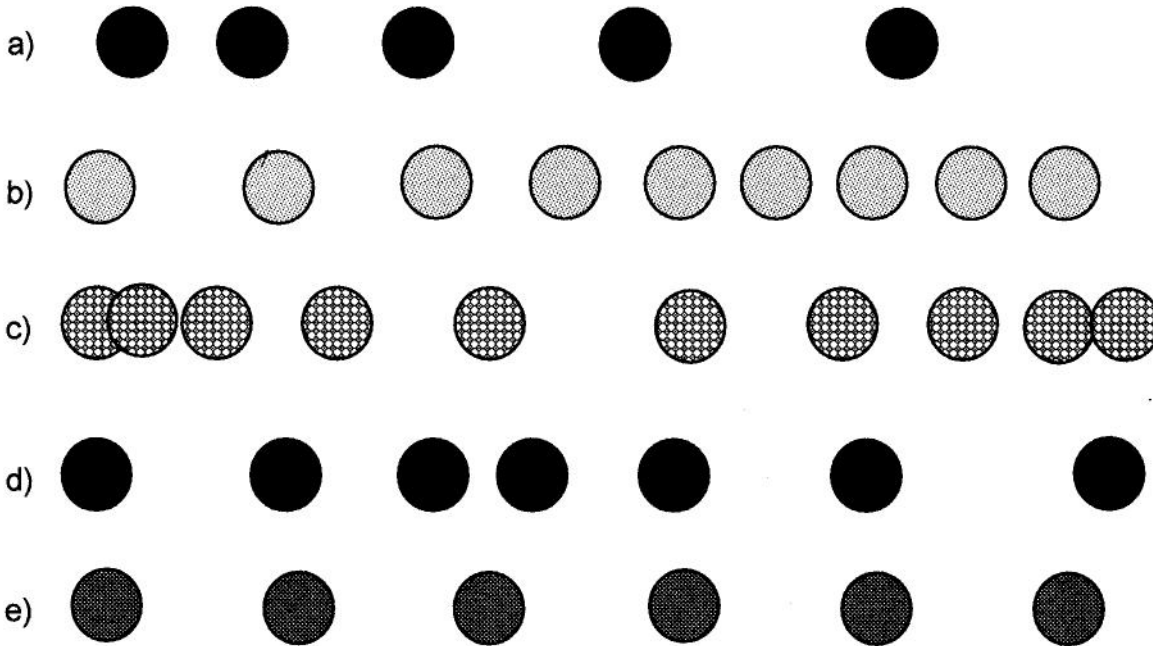


e) None of the above graphs describe the motion as stated in the question.

4.) If a cheetah can run at 60 miles/hour for $\frac{1}{3}$ hour and a gazelle can run at 40 miles/hour for 1 hour, how do the distances they cover compare?

- a) The cheetah covers twice as much distance as the gazelle.
- b) The cheetah covers $\frac{1}{3}$ as much distance as the gazelle.
- c) The gazelle covers two times as much distance as the cheetah.
- d) The gazelle covers the same distance as the cheetah.
- e) The cheetah covers 3 times as much distance as the gazelle.

Answer the next question by choosing the correct strobe photograph from those shown below. The strobe illuminated the ball every $\frac{1}{10}$ second.



5.) Which of the above pictures shows the ball decelerating to a constant slow speed?

6.) Which of the following comments on motion is TRUE?

- a) If you travel 62 miles in a one hour trip, your speed ten minutes into the trip must be 62 mile/hour.
- b) Galileo found that balls rolling down inclined planes traveled a distance proportional to the rolling time.
- c) When a peach falls off a tree, it experiences a net acceleration in the upwards direction.
- d) If an air hockey puck is moving across the page from left to right at 15 cm/s, its velocity would be 15 cm/s to the right.
- e) When you walk in a boat floating on a lake, the boat will move in the same direction under you as you are walking.

7.) Choose which is NOT an example of basic research

- a. Discovering a binary star in another galaxy.
- b. Studying how car bags inflate during an accident
- c. Studying how electrons move inside a thin film conductor
- d. Experimenting on rats to see how their brain synapsis fire when they are under stress.
- e. Synthesizing a molecule which has a tendency to attach itself to gold.

You hear that a friend has been thinking about buying a used car. She has studied the fuel economy and found the following. At 25 mph, the car travels 30 mpg. At 35 mph, the car travels 35 mpg. At 45 mph, the car travels 40 mpg. At 75 mph, the car travels 40 mpg.

8.) Using the information above, how might you describe the trend in the car's fuel efficiency?

- a. The car has the best fuel efficiency below 25 mph.
- b. The efficiency starts out low and then continually increases as the speed increases.
- c. The fuel efficiency at 60 mph might be about 45 mpg given the trends.
- d. The fuel efficiency at 30 mph might be about 40 mpg given the trends.
- e. The car has the worst fuel efficiency at 75 mph.

9.) Choose the answer which turns the number, 0.0000156, into the correct scientific notation.

- a. 15.6×10^{-4}
- b. 156×10^{-5}
- c. 1.56×10^{-6}
- d. 0.0156×10^{-7}
- e. 1.56×10^{-5}

10.) Choose the correct combination of vectors to give you the horizontal and vertical components of the one pictured to the right.

Original Vector



a.)



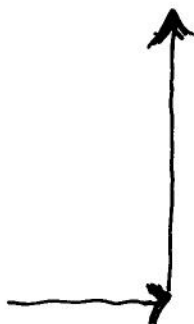
b.)



c.)



d.)



e.)

