

1. Combine each pair of sentences below into one sentence using the words given in brackets. (2 points)

a. Motions in perpendicular directions are independent of one another. This has been concluded from experiments conducted. (It.....that)

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b. The smoother the surface on which a body is moving, the faster it would roll. We know this perfectly well from our experiences. (that)

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c. Earth's gravity affects things near the surface of our planet. Galileo Galilei (1564-1642) was the first to understand this. (how)

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d. The force causes motion and there is no motion if there is no force applied. This conclusion made by Aristotle was incomplete. (the conclusion that)

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2. Rearrange each of the following set of words to make a meaningful sentence. (2 points)

a. solutions/ have/ served/ for/ much/ framework/ theory/ the/ these /as/ of/ current/ on/ theoretical/ the/ work/ big bang/ the

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b. culture/ the/ some/ of/ environmental/a/ creation myths/ reflect/ circumstances/ particular

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c. he/ compact/ proposes/ dense/ extremely/ that/ hot/ the/ once/ big bang theory/ was/an/ and/ planet/ universe

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d. begins/ star/ life/ as/ a/ cool/ relatively/ a/ large/, /in/ nebula/ of/ mass/ gas/ a/ some

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3. Translate to English (1 point)

a. Trong trường hợp vật chuyển động với tốc độ không đổi trên đường tròn, ta có vật mà vận tốc của nó không phải là hằng số; do đó cần thiết phải có một lực tổng hợp hoặc lực không cân bằng tác dụng lên nó.

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b. Trái Đất khi quay xung quanh Mặt Trời có vận tốc thay đổi liên tục. Định luật I Newton nói rằng phải có một lực không cân bằng tác dụng lên nó. Lực đó là lực hút hấp dẫn của mặt trời. Nếu lực này biến mất, chúng ta sẽ chuyển động theo đường thẳng đến một nơi xa xôi ngoài hệ Mặt Trời

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4. Match the words with the suitable phrase (1.5 point)

1. $\frac{3}{4}$	a. W is proportional to A squared
2. $W = \frac{1}{2} kA^2$	b. Three quarters
3. $W \sim A^2$	c. the resistance of matter to any change in its velocity
4. acceleration	d. the resultant force when more than one force acts on an object; the total force that causes acceleration
5. inertia	e. W is equal to a half of the product of k and A squared

6. net force	f. a vector that indicates the rate of change of speed and/or direction of a moving object
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5. Combine each of the following pairs of sentences using an -ing clause (1.5 point)

a. In the limit, we let the strip width approach zero. The number of strips then becomes infinitely large.

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b. We apply Newton's laws of mechanics only in inertia reference frames. These frames move at constant velocity.

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c. Thermal energy is said to be an internal energy of an object. It involves random motions of the atoms and molecules within an object.

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e. When Joule did experiments to warm water with paddle wheels, he wanted to see precisely how much thermal energy came from a given amount of work.

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f. When a warm solid surface touches a cold solid surface, many of the molecules touch, and the faster vibrating molecules will pass vibrational energy along to those vibrating slower.

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6. Reading passage:

Besides the blowing dust and the heavenly bodies, little else moves on the Martian landscape. This lack of movement might seem to be strangest of all, for we humans are used to motion. Almost from birth, infants follow motion with their eyes, and from then on we are continually aware of things moving about, starting, stopping, turning, bouncing. On earth we see liquids flowing, people moving, and the wind stirring the leaves of trees. Although we cannot see them, we know that the very atoms and molecules of matter are continuously in motion. Even mosses and lichens that spend their lives fastened to rocks depend on the movements of gases and liquids to bring them the chemicals essential to life and to carry others away. We take part in motion in our daily lives. We describe and compare this motion in terms of speed, acceleration, and direction. The following will discuss the first two matters.

If we just say something moves, someone else will not really know “what’s happening”. It is one thing to recognize motion but another to describe it. To describe motion accurately, we use rates. A rate tells how fast something happens, or how much something changes in a certain amount of time. An example of rate is a distance divided by a time. Suppose a girl runs a course that is 3 miles long. She might sprint at the beginning but tire and slow down along the way, or even stop to tighten a shoelace, so she won’t travel at the same rate for the entire 3 miles. But if she finishes in, say, 30 minutes, then $3 \text{ miles} / 30 \text{ minutes} = 0.10 \text{ miles/minute}$ is the average rate of travel during that time, or her average speed (average speed = total distance covered/time used). The average speed tells little of what happened during her run, however. If we are curious about her speed at one certain time or at a point along the way, we want to know her instantaneous speed, that is, how fast she was moving at one instant (instantaneous speed = the rate at which something is traveling at a specific time). If you say, “At twelve noon my car was moving at 35 mph”, then you have specified an instantaneous speed

6.1. Choose the correct answer (1 point)

1. On the Martian landscape, there are
 - a. many objects moving.
 - b. only dust and heavenly bodies moving.
 - c. a few matters in motion.

2. We started to learn of motion when
 - a. we are at birth
 - b. we were very small
 - c. we started to learn physics
3. To describe motion, we use
 - a. more than one rates at the same time
 - b. a rate
 - c. at least three rates
4. When a girl is running, she is supposed to have
 - a. one type of speed
 - b. more than one types of speed at the same time
 - c. average speed and instantaneous speed only

6.2. Decide whether each of the following statements is true (T), false (F) or with no information to clarify (N) (1 point)

1. Anything on earth is in motion.
2. Infants are only aware of motion visually.
3. Any motion can be detected with human senses.
4. Mosses and lichens' lives depend on the chemicals from gases and liquids in the environment.