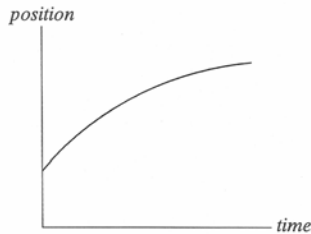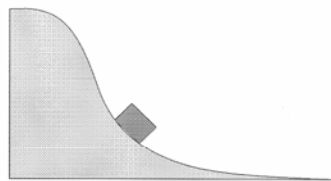**Q A.** A train car moves along a long straight track. The graph shows the position as a function of time for this train. The graph shows that the train:
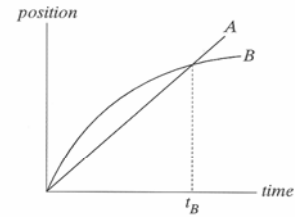

1. speeds up all the time.
2. slows down all the time.
3. speeds up part of the time and slows down part of the time.
4. moves at a constant velocity.

Q B. The graph shows position as a function of time for two trains running on parallel tracks. Which is true:

1. At time t_B, both trains have the same velocity.
2. Both trains speed up all the time.
3. Both trains have the same velocity at some time before t_B.
4. Somewhere on the graph, both trains have the same acceleration.

Q 1. A cart on a roller-coaster rolls down the track shown below. As the cart rolls beyond the point shown, what happens to its speed and acceleration in the direction of motion?


1. Both decrease.
2. The speed decreases, but the acceleration increases.
3. Both remain constant.
4. The speed increases, but acceleration decreases.
5. Both increase.
6. Other

Q 2. A marathon runner runs at a steady 15 km/hr. When the runner is 7.5 km from the finish, a bird begins flying from the runner to the finish at 30 km/hr. When the bird reaches the finish line, it turns around and flies back to the runner, and then turns around again, repeating the back-and-forth trips until the runner reaches the finish line. How many kilometers does the bird travel?
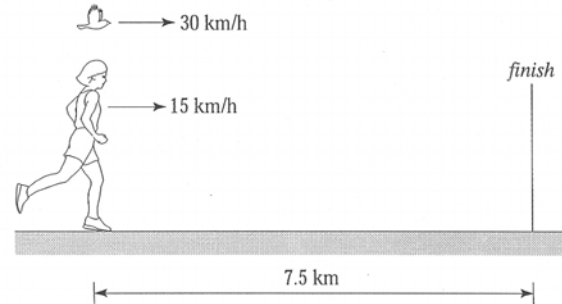
1. 10 km
2. 15 km
3. 20 km
4. 30 km

Answers

QA. 2
QB. 3
Q1. 4
Q2. 2

Note: these are mostly from Eric Mazur, *Peer Instruction* (Prentice Hall, 1996).