

For each question, select the best answer from the four alternatives.

- Under what condition is the average velocity equal to the instantaneous velocity? (1.1) **K/U**
 - always
 - when an object is moving with constant velocity
 - when an object is moving with constant acceleration
 - never
- The space shuttle accelerates to 28 162 km/h in 8.5 min during a launch. What is the average acceleration? (1.1) **K/U T/I**
 - 7.5 m/s²
 - 13 m/s²
 - 14 m/s²
 - 15 m/s²
- An object moving with initial speed v_i starts to slow down with an acceleration of magnitude a . How far does the object travel before stopping? (1.2) **K/U T/I**
 - $\frac{-v_i^2}{2a}$
 - $\frac{v_i^2}{2a}$
 - $\frac{v_i}{2a}$
 - $\frac{3v_i^2}{2a}$
- When adding multiple two-dimensional displacement vectors, which of the following methods is most appropriate to accurately determine the total displacement? (1.3) **K/U**
 - scale diagram method
 - trigonometric method
 - algebraic component method
 - magnitude adding method
- For a car moving forward and then to the right, how does the average speed compare to the average velocity? (1.4) **K/U**
 - The average speed is larger because the distance is greater than the magnitude of the displacement.
 - The average velocity is larger because the magnitude of the displacement is greater than the distance.
 - They are equal because the time is the same for both.
 - The average speed is larger because the magnitude of the displacement is larger than the distance.
- A batter hits the ball in the air. The time the ball takes before it hits the ground depends on which of the following? (1.5) **K/U**
 - only the angle at which the ball is hit
 - the material from which the ball is made
 - only the initial speed with which the ball is hit
 - both the angle and the initial speed with which the ball is hit
- A person is swimming with the flow of a stream. The swimmer's speed relative to the stream is 1.5 km/h, and the stream's speed relative to the bank is 1.0 km/h. What is the speed of the swimmer relative to the bank? (1.6) **K/U T/I**
 - 0.5 km/h
 - 1.0 km/h
 - 1.5 km/h
 - 2.5 km/h

Indicate whether each statement is true or false. If you think the statement is false, rewrite it to make it true.

- The instantaneous velocity at a particular time is the slope of the displacement–time curve at that position. (1.1) **K/U**
- An object can be in free fall after it is dropped or after it is thrown upward. (1.2) **K/U**
- The addition of two displacement vectors depends on the order in which they are added. (1.3) **K/U**
- If the velocity vector of an object changes only in direction, the average acceleration is zero. (1.4) **K/U**
- For a ball thrown in a parabolic path, the y -component of the velocity at the highest point in its trajectory is equal to zero. (1.5) **K/U**
- A stone projected horizontally from a cliff will reach the ground faster than a stone dropped vertically down from the same cliff. (1.5) **K/U**
- The velocity of two cyclists relative to each other, if they are moving in the same direction with equal speed of 20 m/s, is zero. (1.6) **K/U**
- If $\vec{v}_{AB} = 18.3 \text{ m/s [S]}$, then $\vec{v}_{BA} = -18.3 \text{ m/s [N]}$. (1.6) **K/U**

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