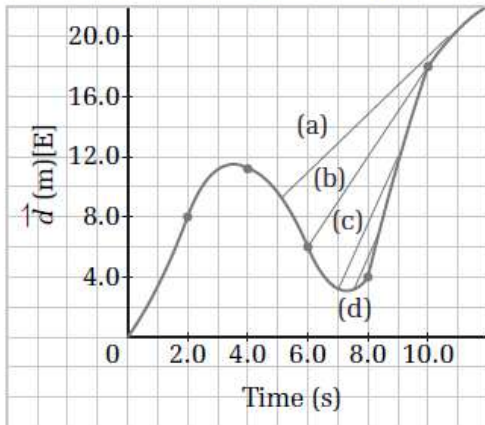
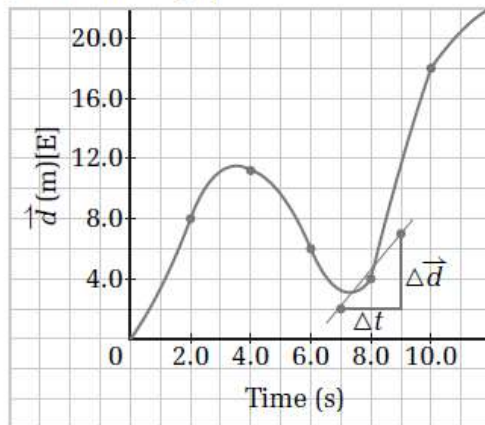


## Answers to Analyze and Conclude Questions

- The average velocities (1.9 m/s, 3.0 m/s, 4.3 m/s, and 3.4 m/s, respectively) were different because each pair of points had a different slope. The positions and time intervals were different each time.



- The value of the slope (2.4 m/s) is approaching the instantaneous velocity at the 8 s point on the graph.



- All of the calculations represent an attempt to determine the velocity of the hawk between intervals of time. The time interval from the pair of points (a) through (d) is successively smaller. The time interval between the points around the 8.0 s mark approaches zero.
- Draw a line so that it just touches the point on the curve corresponding to the specific time in question. The slope of this line will give the instantaneous velocity at that point.
- With reference to the graph that follows, the hawk's velocity at 3.0 s, using the slope of the tangent method, is  $\vec{v} = \frac{(14.0 - 10.0) \text{ m}}{(5.2 - 3.0) \text{ s}} = 1.8 \frac{\text{m}}{\text{s}}$  and at 5.0 s, it is  $\vec{v} = \frac{(4.8 - 12.0) \text{ m}}{(7.0 - 4.0) \text{ s}} = -2.4 \frac{\text{m}}{\text{s}}$ .