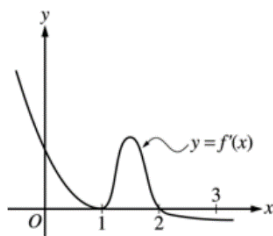


CHA	Notes Unit 6		
4	Topic: 6.1	Exploring Accumulations of Change	
Learning Objective CHA-4.A: Interpret the meaning of areas associated with the graph of a rate of change in context.			

Before we immerse ourselves in the next branch of calculus, integration, let's start with a few questions that introduce this important idea.

**Example 1:**

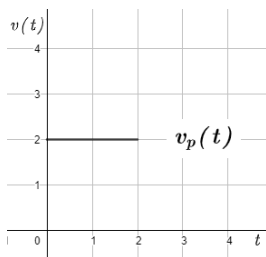


The graph of  $f'$ , the derivative of the function  $f$ , is shown to the left.

If  $f(0) = 0$  and  $f'(0) = 1$ , which of the following must be true?

- I.  $f(0) > f(1)$     II.  $f(2) > f(1)$     III.  $f(1) > f(3)$   
 (A) I only    (B) II only    (C) III only    (D) I and II only

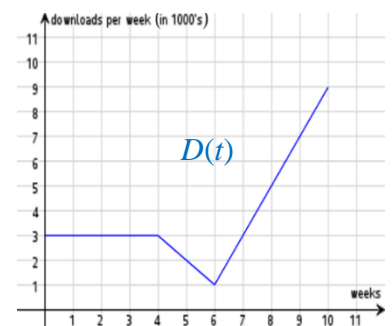
**Example 2:**



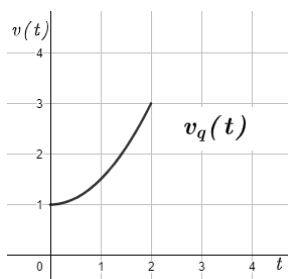
A particle  $P$  moves along a straight path with a constant velocity of 2 ft/sec. The graph of  $v_p(t)$ , the velocity of particle  $P$  at time  $t$ , is shown to the left. What is the total distance the particle traveled from  $t = 0$  to  $t = 2$  second?

**Example 3:**

The new pop music group sensation, Sir Isaac and the Newtones, have released their latest single on all the major music streaming services. During its first 10 weeks of release, the rate of the number of downloads per week (in thousands of units) is modeled by the function  $D(t)$  whose graph is shown to the right. How many total downloads were purchased during the 10-week period?



Let's revisit a similar situation that was presented to us back in Example 2.



A particle  $Q$  moves along a straight path with. The graph of the velocity of particle  $Q$ ,  $v_q(t)$ , at time  $t$ , is shown to the left. How would one go about finding the total distance the particle traveled from  $t = 0$  to  $t = 2$  second?

The situation presented above will be the focus of Topic 6.2