

Interpreting the Derivative

1. Suppose it starts snowing at 12 noon. Interpret each of the following, where $H(t)$ is the height of snow in inches as a function of time t in hours after 12 noon.

(a) $H(6) = 4$	(b) $H'(6) = 1.5$
(c) $H(20) = 13$	(d) $H'(20) = 0$
(e) $H'(23) < 0$	

2. Let $S(t)$ be a child's distance from home as a function of time. Is $S'(t)$ positive, negative or zero if:

(a) The child is at home.	(b) The child is going to school.
(c) The child is at school.	(d) The child is coming home.

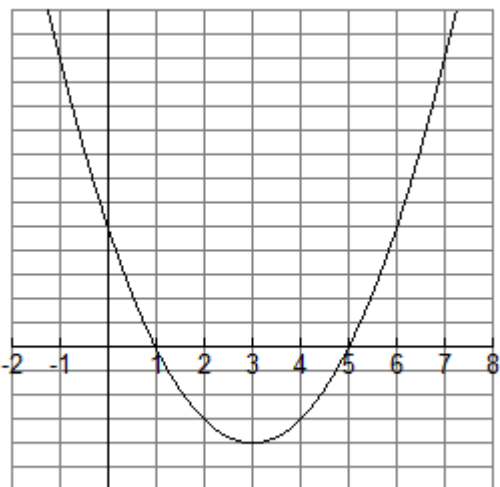
3. Let $h(t)$ be a person's height in inches at age t years. Write a sentence, using appropriate units, explaining the meaning of each of the following.

(a) $h(12) = 56$

(b) $h'(12) = 2.5$

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4. The graph of the function $f(x)$ is shown. For each value $x = a$ in the chart below, indicate whether $f(a)$ is positive, negative, or zero, and whether $f'(a)$ is positive, negative, or zero.



a	$f(a)$	$f'(a)$
-1	positive	negative
0		
1		
3		
5		
6		

5. (Based on p. 111/ #53) The table shows the estimated percentage P of the population of Brazil that are mobile-phone subscribers. (End of year estimates are given.)

Year	1997	1999	2001	2003	2005	2007
P	2.7	8.8	16.3	25.6	46.3	63.1

- (a) Estimate the instantaneous rate of growth in 2003 by taking the average of the two average rates of change of P from 2003 to 2005 and from 2001 to 2003. What are the units?
- (b) Estimate the instantaneous rate of growth in 2003 by finding the average rate of change of P from 2001 to 2005.