

AB CalcLog 3.3

A particle moves along a horizontal line with a positive velocity $v(t)$, where v is a differentiable function of t . The time t is measured in seconds, and the velocity is measured in cm/sec. The velocity of the particle at selected times is given in the table below.

t (sec)	0	2	4	6	8	10	12
$v(t)$ (cm/sec)	37	17	5	1	6	17	38

1. Based on the values in the table, what is the smallest number of times at which the velocity of the particle could equal 20 cm/sec on the open interval $0 < t < 12$ seconds? Justify your answer.
2. Based on the values in the table, what is the smallest number of times at which the acceleration of the particle could equal zero on the open interval $0 < t < 12$ seconds? Justify your answer.
3. Find the average acceleration of the particle over the time interval $8 \leq t \leq 10$ seconds. Show the computations that lead to your answer, and indicate units of measure.
4. Use data from the table to approximate the acceleration of the particle at $t = 7$ seconds. Indicate units of measure.