2.5 The Second Derivative

Name: Date:

P 16. An accelerating sports car goes from 0 mph to 60 mph in five seconds. Its velocity is given in the following table, converted from miles per hour to feet per second, so that all time measurements are in seconds. (Note: 1 mph is 22/15 ft/sec.) Find the average velocity of the car over each of the first two seconds.

| Time, t(sec)	0	1	2	3	4	5
Velocity, $v(t)$(ft/sec)	0	30	52	68	80	88

P 17. Sketch the curves described in (a)-(c):

(a) Slope is positive and increasing at first but then is positive and decreasing.

(b) The first derivative of the function whose graph is in part (a).

(c) The second derivative of the function whose graph is in part (a).

P 22. Graph the second derivative of the function.
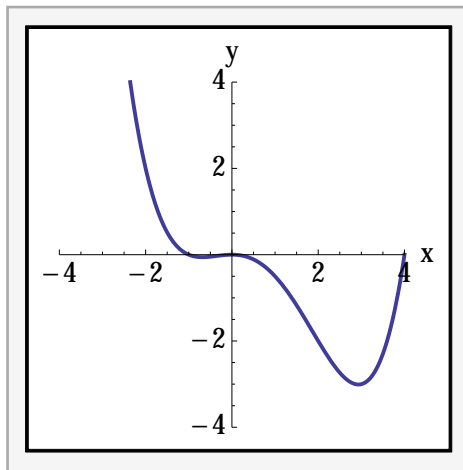
P 29. The graph below gives the position, $f(t)$, of a particle at time t. At which of the marked values of t can the following statements be true?
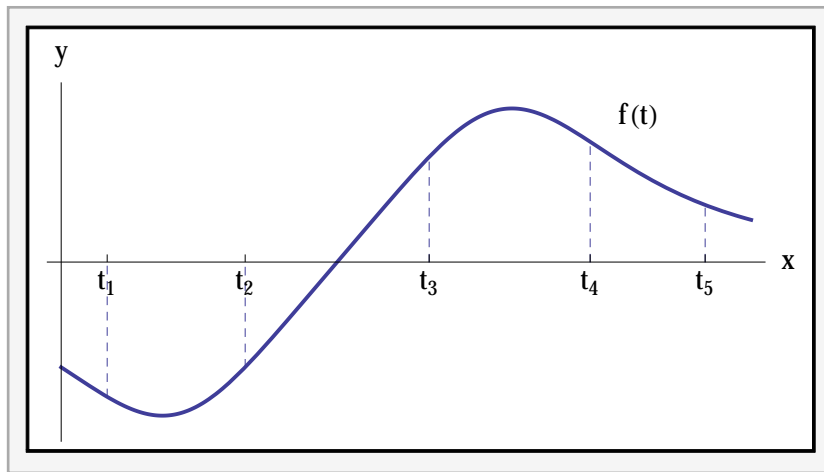
(a) The position is positive

(b) The velocity is positive

(c) The acceleration is positive

(d) The position is decreasing

(e) The velocity is decreasing