A rat moves through a tunnel with velocity given by \( v(t) = t^3 - 9t^2 + 19t \) (in feet/sec), over a 6 second time interval, \( 0 \leq t \leq 6 \).

(a) Find the change in position of the rat (relative to its starting point) after 6 seconds.

(b) Find the total distance traveled by the rat over the 6 seconds.

(c) Find the average velocity of the rat over this time interval.

(d) Find the average speed of the rat over this time interval.

(e) Find the average acceleration of the rat over this time interval

(f) Find the time when the rat is farthest from where he started (over this time interval).