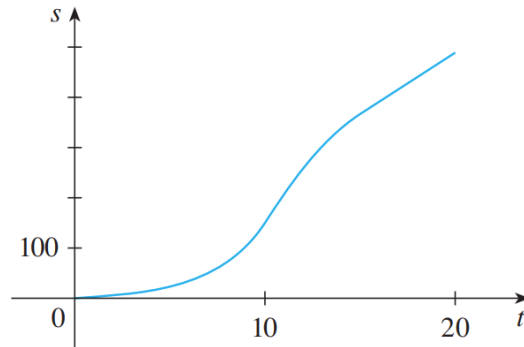


Exercise 56

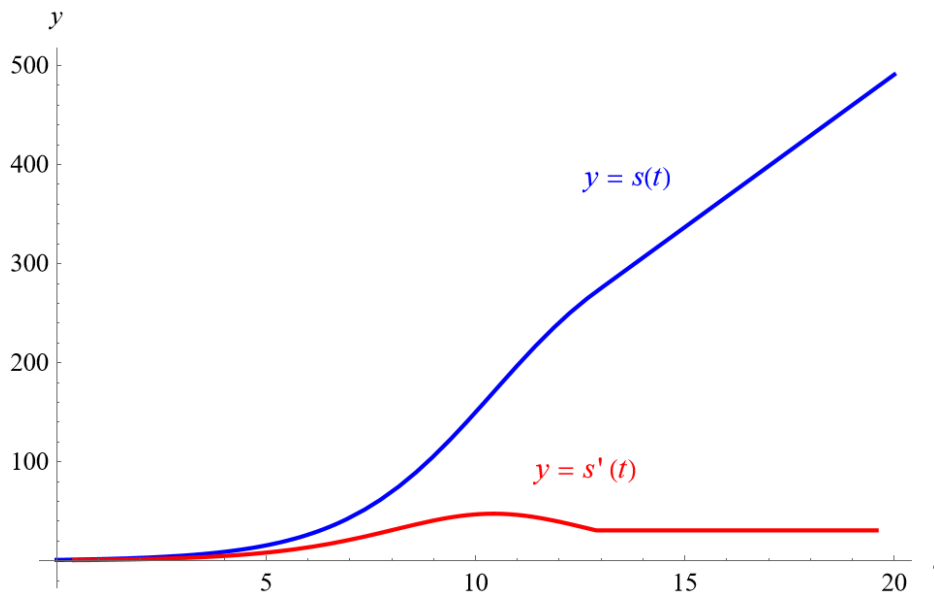
- (a) The graph of a position function of a car is shown, where s is measured in feet and t in seconds. Use it to graph the velocity and acceleration of the car. What is the acceleration at $t = 10$ seconds?



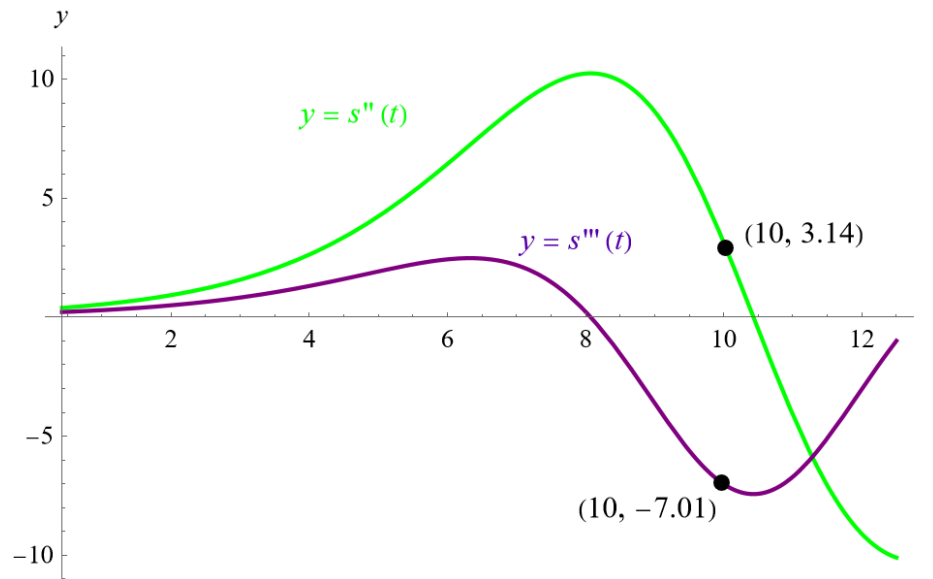
- (b) Use the acceleration curve from part (a) to estimate the jerk at $t = 10$ seconds. What are the units for jerk?

Solution

A graph of the position and velocity is shown below.



A graph of the acceleration and jerk is shown below.



The acceleration and jerk at $t = 10$ seconds are

$$s''(10) \approx 3.14 \frac{\text{ft}}{\text{s}^2}$$

$$s'''(10) \approx -7.01 \frac{\text{ft}}{\text{s}^3},$$

respectively.