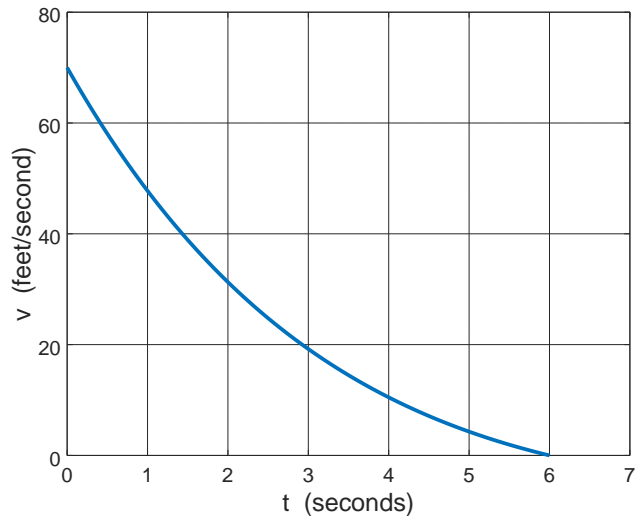


1. The velocity graph $v(t)$ of a braking car is shown.

(a) Use the graph to estimate the distance traveled by the car when the brakes are applied. (*Suggestion: Use 3 or 6 rectangles.*)



(b) Write the exact distance as a definite integral.

2. Evaluate the upper and lower sums for $f(x) = 2 + \sin x$ on $0 \leq x \leq \pi$ with $n = 4$. Illustrate with a diagram.

3. Evaluate the integral by interpreting it in terms of areas. (*Hint: Start by sketching the integrand.*)

$$\int_{-4}^3 \left| \frac{1}{2}x \right| dx$$

4. (a) Set up an expression for the following integral as a limit of sums; you will not be able to compute the limit:

$$\int_0^5 \arctan x dx$$

- (b) Using a graph of $y = \arctan x$, sketch a diagram which shows that

$$\frac{5 \arctan(5)}{2} \leq \int_0^5 \arctan x dx \leq \frac{5\pi}{2}$$