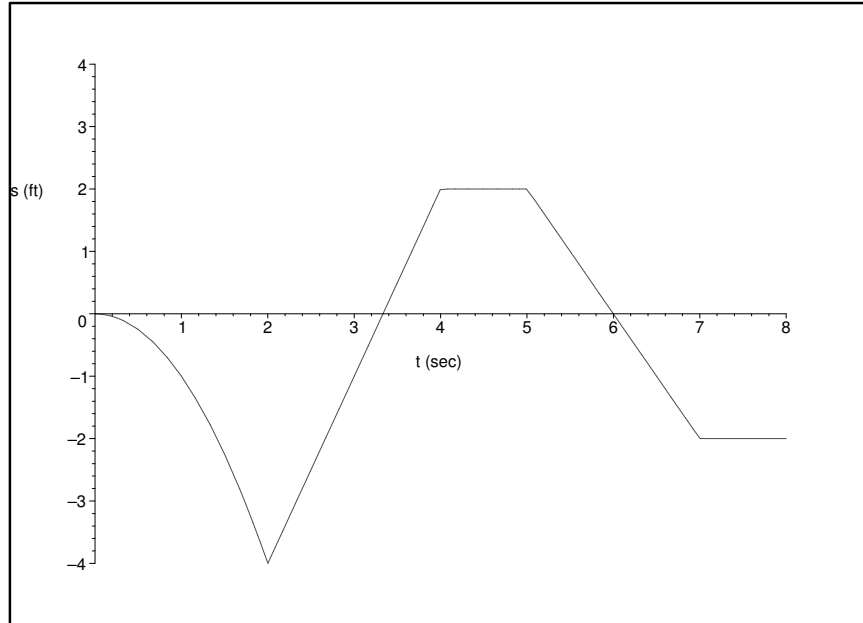


5. (10 points) Prove that the curves $f(x) = \sin(x)$ and $g(x) = x^2 - 2$ intersect at least once in the interval $[0, \pi]$. **Note:** A graph is not sufficient proof for this problem. (Hint: Intermediate Value Theorem).
6. (15 points) Consider the following figure that gives the position (in feet) of a particle as a function of time (in seconds) for $0 \leq t \leq 8$ and answer the questions following the figure.



- (a) When is the particle moving forward? Backward? Stationary?
- (b) Clearly graph the particle's velocity, where defined.
- (c) When is the particle's acceleration positive? Negative? Zero?
- (d) At what time (or times) is the particle the farthest from where it started at $t = 0$?