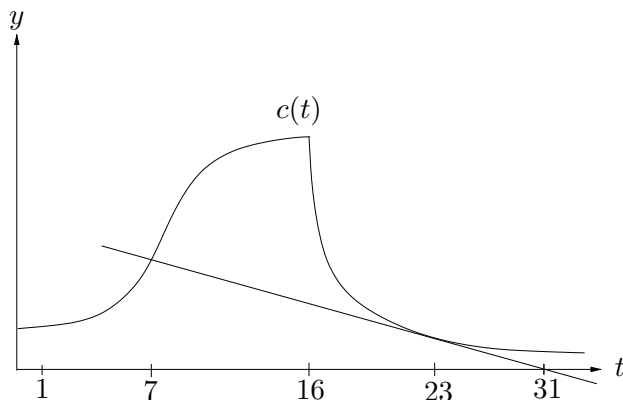


8. (14 points) As Sweetest Day (October 16th) approaches, millions of Americans flock to stores to buy their special someone a card. The number of cards sold can be approximated by the continuous function c graphed below where $c(t)$ gives the number of cards sold on day t and $t = 1$ corresponds to October 1.



- (a) Are there any t values where the function may not be differentiable? Explain.
- (b) Explain the concavity of the graph between October 1 and October 16 in the context of this problem.
- (c) If on October 1 there are 30,000 cards sold and on October 23 there are 25,000 cards sold, what is the average rate of change of $c(t)$ over this time? Express your final answer in sentence form and in the context of this problem.
- (d) How many cards were sold on October 7? Show your work.