

Section 3.4 – Lecture Notes/Examples

Solve the following application problems. Be sure to answer all word problems in complete sentences.

1. An all-news radio station has made a survey of the local listening habits of local residents between 5pm and midnight. The survey indicates the percentage of local adult population that is tuned in to the station x hours after 5:00pm is modeled by the function

$$f(x) = \frac{1}{8}(-2x^3 + 27x^2 - 108x + 240).$$

- a. At what time between 5pm and midnight are the most people listening?
What percentage of the population is listening at this time?
 - b. At what time are the fewest people listening?
What percentage of the population is listening at this time?
2. A poll indicates that x months after a particular candidate declares her candidacy, she will have the support of $s(x)$ percent of the voters, where

$$s(x) = \frac{1}{29}(-x^3 + 6x^2 + 63x + 1080) \quad \text{for } 0 \leq x \leq 12$$

- a. If the election is held in November, when should she announce her candidacy?
- b. Find the max percentage of voter support?
- c. Should she expect to win if she needs at least 50% of the vote?

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