4.5 Average Cost

Example 1. The total cost of T-shirts is $C(q) = q^3 - 13q^2 + 51q$ for $0 \leq q \leq 10$ (for the sake of realism we’ll suppose that $q$ is measured in thousands, but this doesn’t affect the problem one way or the other).

(a) Estimate using the graph of $C(q)$ where $a(q)$ has a minimum.

(b) Solve for $q$ using Calculus and algebra to minimize $a(q)$. 

![Graph of C(q)](image-url)
Example 2. (Based on Hughes-Hallett, 3e, 4.5#10) The marginal cost at a production level of 2000 units of an item is $10 per unit and the total cost is $30000. If the production level were increased slightly above 2000, would the following quantities increase or decrease, or is it impossible to tell? Why?

(a) Average cost  (b) Profit