Name: _____ Section: _____

Instructions: Show all your work in order to receive proper credit. No formula sheets and no notes are allowed during the quiz. No cell phones, calculators, or any other electronic devices are allowed in a student's possession during any quiz. All such devices must be put away in the student's bag, out of reach of the student during the quiz. Quiz should be completed in one seating with no breaks. Box your final answer. Good luck! **Timing:** 15 minutes

1. **(3 pts)** Use linear approximation to estimate $(1.005)^{50}$.

2. **(3 pts)** Water is falling on a surface, wetting a circular area that is expanding at a rate of 18π mm^2/s. How fast is the radius of the wetted area expanding when the radius is 12 mm? You must include correct units as part of your answer.

3. **(4 pts)** A manufacturer's total cost is:

$$C(q) = 3q^2 + q + 500$$

dollars, where q is the number of units produced.

a. Use marginal analysis to *estimate* the cost of manufacturing the 41st unit. You must include correct units as part of your answer.

b. Compute the *actual cost* of manufacturing the 41st unit. You must include correct units as part of your answer.