

Exam #3

Math 116-C

Monday, January 22, 2001

Please staple this sheet to the top of your work when you turn in your exam.
For full credit show all of your work.

1. A fast-food restaurant sells 3000 hamburgers per week at a price of \$0.60 per hamburger. For each additional cent the restaurant charges, sales drop by 100 hamburgers.

What price should the restaurant charge to maximize revenue?

2. A grocery store sells 4500 pounds of flour every year. It costs \$1 to store a pound of flour for a year. Every order to the wholesaler for more flour has a fixed cost of \$10. The wholesaler charges the store \$0.43 for every pound of flour.

How many pounds of flour should the store get per order to minimize cost?
How many orders should it place per year?

3. What is the future value of an investment of \$4500 for six years at 9% compounded quarterly?
4. How long will it take an investment of \$3400 to grow to \$6300 at a rate of 7.5% that is compounded monthly?
5. Find y' where $y = \ln(e^x - x^2)$.
6. Find y' where $x^2y^3 = x - y$.
7. Given a population p for this year, let $f(p) = p(17 - 0.02p)$ be next year's population for a given herd. What p will maximize the sustainable yield for this herd?
8. Find where y is concave up, concave down, and where any inflection points are, where $y = xe^x$.
9. Explain what elasticity of demand measures.
10. Twenty grams of a radioactive isotope takes 15 years to decay to ten grams. How long will it take to decay to four grams?