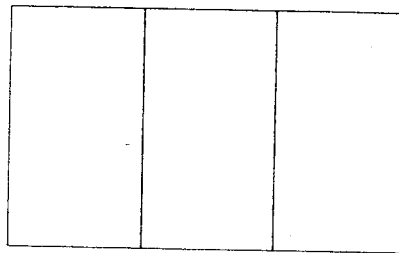


Math 211: Exam #2
March 31, 2003

Name: _____
TA: _____

1. A farmer wants to build a rectangular fence divided into three equal parts as shown. The exterior fence will be wooden and the fence making up the inside will be chain-link. The wooden fence costs \$10 per foot and the chain link fence costs \$5 per foot. He needs the total area to be 6000 square feet. Find the dimensions which will minimize the cost of the fence.



2. **Setup only.** A CD manufacturer estimates that people will buy 10,000 copies of a certain CD this year. Each CD costs \$10 to print, and setup costs are \$1000 for each printing. If storage costs are \$4 per book per year, find how many books should be printed per run and how many printings will be needed if costs are to be minimized. *Setup this problem only. That is, simply define a function (of one variable) which you could minimize using the techniques from this class. Be clear how the variables are defined.*

3. Cheryl and John leave an intersection at the same time. Cheryl is walking north at 4 miles per hour and John walks east at 3 miles per hour. How fast is the distance between them growing 2 hours after they leave the intersection?

4. A CD seller wants to increase revenue by discounting a particular CD. If the demand function for the CD is

$$D(p) = 60 - 3p,$$

where p is the price of the CD, and the current price is \$15, will the discount succeed? Why?

5. Find $f'(x)$ for the following functions.

(a) $f(x) = \ln(x^2 - 5)$

(b) $f(x) = e^{\pi}$

(c) $f(x) = e^{3x^2 - 2x}$

(d) $f(x) = 3^x$

6. Find the following antiderivatives.

(a) $\int (x^2 + 2) dx$

(b) $\int e^{5x} dx$

7. Evaluate:

(a) $\int_1^{e^3} \frac{dy}{y}$

(b) $\int_1^2 (3x^2 + 4x - 5) dx$

Bonus: Evaluate the following definite integral. *Hint: I don't care how you find it. Also, don't spend too long on this one.*

$$\int_0^1 \sqrt{1-x^2} dx$$