

Math U141 Fall 07 Prof. A. Iarrobino Name _____

Problems #1,2 will count 5 points each. The third will count 2 pts EC.

1.(5 pts) Find antiderivatives F of the following functions.

A. $f = 2x^3 - 3x + 2$. Find an antiderivative F satisfying $F(2)=5$.

B. $f = 7 \cdot \sqrt[5]{x^8} - \frac{3}{x^{2.5}} + 9(4x - 5)^8 + \frac{1}{50x^{1.02}} + \frac{2}{x}$. Find a general antiderivative F.

2. (5 pts) A quick frog on Planet M where the acceleration of gravity is -16 feet per sec², jumps vertically upward with an initial velocity of 24 feet per second, from an 80 foot hill above a pond.

a. Determine its velocity $v(t)$ and position $s(t)$ as a function of time.

b. When is it highest? How high does it leap?

c. When does it land on a lily pad floating on the pond? How fast is it traveling then?

d*. Discuss whether the frog gets wet.

3. (2 pts) Eight equal garden plots, arranged in 2 rows of four, will enclose a total of 4800 square feet. Outside fencing costs $\$5$ a foot, and inside $\$2$ a foot. Letting x = length of a whole row, and y the length of a whole side, determine x,y so as to minimize the cost. Hint: verify that $C=12x+16y$.

Quadratic formula: $ax^2 + bx + c = 0$ has solution $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

: $\int x^n dx = \frac{x^{n+1}}{n+1} + C$ if $n \neq -1$, $\int x^{-1} dx = \ln(x) + C$, $\int b^x dx = \frac{b^x}{\ln(b)} + C$, $\int e^{ax} = \frac{1}{a} e^{ax} + C$

$\int \sin(ax) = -\frac{1}{a} \cos(ax)$, $\int \cos(ax) = \frac{1}{a} \sin(ax)$