

**Math 151**  
**Quiz 7**  
**Fall 2008**

Show all work in a neat and organized fashion. Clearly indicate your answers.  
20 points possible.

1. (5 pts.) Find the most general antiderivative of the given function.

$$f(x) = \sqrt[4]{x^3} + \sin x$$

2. (5 pts.) Find  $f(x)$ , given the following.

$$f'(x) = 6x^2 + 6x + 6, \quad f(1) = 19$$

3. (5 pts.) Use Newton's method to find the root of the given equation to the best accuracy your calculator will display. Use the specified initial approximation  $x_1$ , and show your values for  $x_2$ ,  $x_3$ ,  $x_4$ , and so on, until the algorithm stabilizes.

$$x^4 + x - 3 = 0, \quad x_1 = 1$$

Recall that

$$x_2 = x_1 - \frac{f(x_1)}{f'(x_1)} \quad \text{and} \quad x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}.$$

4. (5 pts.) A farmer wants to fence an area of 80,000 square meters in a rectangular field and then divide it into five pens with fencing parallel to one side of the rectangle. What dimensions of the field will minimize the total length of fencing?