Name: ________________________________  Section: __________

Clear your desk of everything except pens, pencils and erasers. Show all your work. If you have a question raise your hand and I will come to you.

1. Use Newton’s Method to approximate \( \sqrt[3]{25} \).

   (a) (1 point) **Multiple Choice. Circle the best answer. No partial credit available**
   
   When approximating \( \sqrt[3]{25} \) using newton’s method we should use the function \( f(x) \) and starting point \( x_1 \) where:

   A. \( f(x) = x^3 - 25, x_1 = 27 \)

   B. \( f(x) = x^3 - 25, x_1 = 3 \)

   C. \( f(x) = \sqrt[3]{x}, x_1 = 27 \)

   D. \( f(x) = \sqrt[3]{x}, x_1 = 3 \)

   (b) (2 points) **Fill-in-the-Blank. No partial credit available**

   Using (a) above and Newton’s method we can find that: \( x_2 = 3 - \frac{2}{27} \)

2. (1 point) Find the most general antiderivative of each function:

   (a) \( f(x) = \sec(x)(3 \sec(x) - \tan(x)) = 3 \sec^2(x) - \sec(x) \tan(x) \)

   **Solution:** The antiderivative \( F(x) \) is given by

   \[
   F(x) = 3 \tan(x) - \sec(x) + C
   \]

   (b) \( f(x) = 1 + x + x^2 + x^3 \)

   **Solution:** The antiderivative \( F(x) \) is given by

   \[
   F(x) = x + \frac{x^2}{2} + \frac{x^3}{3} + \frac{x^4}{4} + C
   \]