Instructions. Put your first and last name at the top of your paper. Everyone is to do their own worksheet but only one from each group is graded with the score shared. Be sure to show your work and explain your reasoning. All worksheets from each group will be collected. This worksheet has two sides, and four problems.

1. Use Newton’s Method to approximate the number $\sqrt[100]{100}$ correctly to three decimal places.

2. Find the most general antiderivative of the function $r(\theta) = \sec(\theta) \tan(\theta) - 2e^\theta$. 
3. If \( f''(x) = x^6 - 4x^4 + x + 1 \), find the most general form of \( f \). (Hint: there should be at least one arbitrary constant in your answer!)

4. A particle is moving with acceleration function \( a(t) = 3\cos t - 2\sin t \). The position \( p(0) \) at \( t = 0 \) is 0, and the velocity \( v(0) \) at \( t = 0 \) is \(-2\). Find the position function for the particle.