1. Compute the following integrals.

   (a) $\int x \arctan(x)\, dx.$

   (b) $\int \dfrac{dx}{\sqrt{4x^2 + 8x - 12}}.$

   (c) $\int_1^2 \dfrac{dx}{x^2(x + 1)}.$

2. Compute $\int \sec^3 x\, dx.$ *Hint:* $\sec^3 x = \frac{\cos x}{\cos^4 x}$, *make a substitution then use partial fractions.*

3. You are helping Reggie get out of a 50 foot well by lifting him with a rope which weighs .2 lb/ft. Since Reggie is wet, he is dripping water and steadily becomes .05 pounds lighter with every foot you lift him. If wet Reggie initially weighs 200 pounds, find the total work done to get him out of the well. *Write your answer on the back of this page.*