Instructions: Show all of your work and mark your answers clearly. Each problem is worth 5 points.

1. Evaluate $\int_{-1}^{2} |x| \, dx$ by interpreting it in terms of area.

2. Use Part 1 of the Fundamental Theorem of Calculus to find $\frac{d}{dx} \int_{2}^{1/x} \sin^4 t \, dt$. 
3. Evaluate the following integrals using Part 2 of the Fundamental Theorem of Calculus (i.e. using antiderivatives).

(a) \[ \int_{-1}^{2} (x^3 - 2x) \, dx. \]

(b) \[ \int_{0}^{\pi/4} \sec^2 t \, dt. \]