Problem 1 (3 points). *Compute the following definite integral:*

$$\int_{\pi/4}^{0} (\sec^2(x) + 2)dx$$

Problem 2 (2 points each). *State the general antiderivative:*

(a) $\int (x^3 + 2x)dx$

(b) $\int x^{-1}dx$

Problem 3 (3 points). *Compute the following derivative:*

$$\frac{d}{dx} \int_{\cos x}^{\cos^{-1} x} \ln(t)dt$$