

No books, notes or graphing calculators. Turn off your cell phones. Good luck!

- (5) 1. Compute the derivatives of the following functions

$$(a) [2\text{pt}] \quad g(x) = \int_0^x \sin t \, dt, \quad (b) [3\text{pt}] \quad h(x) = \int_0^{x^2} \sin t \, dt.$$

- (5) 2. Compute the definite integral  $\int_0^{\pi/4} (2 \sec^2 \theta - 3 \cos \theta) \, d\theta$ . Leave your answer in exact form.

3. [Bonus problem: 1 bonus point] Compute the definite integral  $\int_{-4}^2 \sqrt{8 - 2x - x^2} \, dx$