

Name: \_\_\_\_\_

Card #: \_\_\_\_\_

Clear your desk of everything excepts pens, pencils and erasers. **Show all your work.**

If you have a question raise your hand and I will come to you.

**1. Fill-in-the-Blank. No partial credit available**

Let  $G(x) = \int_0^x \tan(t^3) dt$

(a) (1 point)  $G'(x) = \tan(x^3)$  \_\_\_\_\_

(b) (1 point)  $G''(x) = \sec^2(x^3) \cdot 3x^2$  \_\_\_\_\_

**Extra Work Space.**

2. Evaluate the definite integrals:

(a) (1 point)  $\int_1^2 (3x^2 - 4x + 1) \, dx$

**Solution:**

$$\begin{aligned}\int_1^2 (3x^2 - 4x + 1) \, dx &= [x^3 - 2x^2 + x]_1^2 \\ &= [8 - 8 + 2] - [1 - 2 + 1] \\ &= \boxed{2}\end{aligned}$$

(b) (1 point)  $\int_0^{\pi/4} \left( \sin(x) - \cos(x) + \frac{1}{\cos^2(x)} \right) \, dx$

**Solution:**

$$\begin{aligned}\int_0^{\pi/4} \left( \sin(x) - \cos(x) + \frac{1}{\cos^2(x)} \right) \, dx &= [-\cos x - \sin x + \tan x]_0^{\pi/4} \\ &= \left[ -\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2} + 1 \right] - [-1 - 0 + 0] \\ &= \boxed{2 - \sqrt{2}}\end{aligned}$$