Clear your desk of everything except 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.

Continue on to back side
2. Evaluate the definite integrals:

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

Solution:

\[
\int_1^2 (3x^2 - 4x + 1) \, dx = \left[ x^3 - 2x^2 + x \right]_1^2 \\
= [8 - 8 + 2] - [1 - 2 + 1] \\
= 2
\]

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

Solution:

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