MAT 271 – Calculus II
Sample Test 2
Instructor: Rafael Pacheco

NAME: ________________________________________________

ASU ID # ___________________________ Section No. ___________________________

Note: All work to be shown on the pages provided for full credit, use reverse side if necessary. No books, notes or calculators of any kind are permitted. No time limit.

1. (10 points each) Evaluate the following integrals:

1. \[ \int \frac{e^{3x}}{e^{3x} + 1} \, dx = \]
2. \[ \int x e^{3x} \, dx = \]
3. \[ \int t \ln(3t) \, dt = \]
4. \[ \int_0^{\pi} \sqrt{\tan(x)} \sec^2(x) \, dx = \]
5. \[ \int \frac{3x + 1}{(x^2 + 1)(x + 1)} \, dx = \]
6. \[ \int x \sqrt{x - 1} \, dx = \]
7. \[ \int \cos(2x) \cos(\sin(2x)) \, dx = \]
8. \[ \int \arcsin(\theta) \, d\theta = \]
9. \[ \int \frac{(\ln(2x))^2}{x} \, dx = \]
10. \[ \int e^{-x^2} \, dx = \]
11. \[ \int \tan^3 x \sec^3 x \, dx = \]
12. \[ \int \frac{1}{t^2 \sqrt{t^2 - 9}} \, dt = \]
13. \[ \int \frac{2x - 2}{(x^2 - 2x + 3)^5} \, dx = \]
2. A water storage tank has the shape of a cylinder with diameter 10m. It is mounted so that the circular cross-sections are vertical. The depth of the water is 6m.

- Using the slicing technique set up but do not evaluate an integral for the volume of the water contained in the tank. **Explain carefully with a picture how you slice the region** (15 points).

- What percentage of the total capacity is being used? (15 points.)