Calculus II Test 1 NAME_____

No calculators, books, or notes allowed. Justify your answers by giving appropriate arguments and steps. Circle answers

PART I: Short problems. Simplify and circle answers. No partial credit. Four points each.

1. Put in correct partial fraction format, but do not solve for the unknown constants $\frac{1}{x(x+3)(x+9)}$.

2. Evaluate $\int_1^2 x^3\,dx$.

3. Let $g(x) = \int_1^{x^3} \frac{1}{\sqrt{s^2+1}}\,ds$ and find the derivative $g'(x)$.

4. Find $\int \sin^3 x \, dx$

5. Find $\int \cos(5x + 2) \, dx$

6. Put in partial fraction form. Do not solve for the unknown constants $\frac{1}{x^2(x+1)^2(x^2+2)}$.

7. Evaluate $\int_2^5 \frac{1}{x} \, dx$

8. Find $\int \sin^2(3x)\,dx$

9. Find $\int \frac{2x}{3+x^2}\,dx$.

10. Make the substitution $u = x^2$ in the definite integral $\int_2^3 \frac{2x}{1+x^4}\,dx$, writing the new form of the definite integral. DO NOT EVALUATE.

PART II. Partial credit possible. Simplify and circle your answers. Ten points each.

11. Find $\int x^3(1-x^4)^7\,dx$.

12. Find $\int x\cos(3x)\,dx$.

13. Find $\int \frac{1}{x^2(x+3)}\,dx$.

14. Let $A > 0$ be a positive number. The curves $y = A^2 - x^2$ and $y = x^2 - A^2$ intersect to form the boundary of a finite region. Sketch the graph and find the area of the region.

15. Evaluate $\int_2^6 x\sqrt{x-2}\,dx$

16. Evaluate $\int_2^\infty \frac{1}{x^2-1}\,dx$