

Name: _____

MA2 Exam 5 Review Sheet

Exam 5 will be on Thursday, May 18, 2006. All problems must be answered using calculus techniques. Final answers must be *exact* (not rounded), *in simplest form*, and include appropriate *units* unless otherwise indicated. Put a box around your final answer. Graphing calculators, though not required, may be used on the exam, with the following exceptions: TI-89, TI-92, or any calculator with symbolic manipulation abilities.

In problems 1 through 8, evaluate each integral:

1. $\int 5x^2 dx$

2. $\int (y^6 - 4y^{-2} + \sqrt[4]{y^3}) dy$

3. $\int \cos^4 x \sin x dx$

4. $\int \frac{5}{x} dx$

5. $\int e^{4x} dx$

6. $\int x\sqrt{3x^2 + 1} dx$

7. $\int \frac{e^{\sin x}}{\sec x} dx$

8. $\int \sec^3(5t) \sec(5t) \tan(5t) dt$

9. Find the equation of a curve such that $y'' = 7x - 2$ and, at the point $(2, 0)$, $y' = 3$.

In problems 10 through 15, compute each definite integral.

$$10. \int_0^1 x \, dx$$

$$11. \int_{-3}^1 (6x^2 - 5x + 2) \, dx$$

$$12. \int_1^e \frac{1}{x \ln x} \, dx$$

$$13. \int_0^3 \frac{x \, dx}{\sqrt{x^2 + 16}}$$

$$14. \int_{-1}^2 \frac{3}{t^4} \, dt$$

$$15. \int_0^{\pi/2} (\cos \theta + 2 \sin \theta) \, d\theta$$

16. Find $f(x)$ if $f'(x) = 8t^3 + 5$ and $f(1) = -4$.

17. A particle moves along the x -axis at a velocity of $v(t) = \frac{1}{\sqrt{t}}$, $t \geq 0$. At time $t = 1$, its position is $x = 4$.
Find the acceleration and position functions for the particle.