

Name: _____

MA2 Exam 3 Review Sheet

Exam 3 will be on Wednesday, April 25, 2007. 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. Express answers using *positive exponents only*. 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 14, evaluate each integral:

1. $\int 5x^2 dx$

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

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

4. $\int dx$

5. $\int \frac{5}{x^2} dx$

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

10. $\int (6x^2 - 5x + 2) dx$

11. $\int \frac{1}{x \ln x} dx$

12. $\int \frac{x dx}{\sqrt{x^2 + 16}}$

13. $\int (\cos \theta + 2 \sin \theta) d\theta$

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

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

16. Find $f(x)$ if $f'(x) = 8x^3 + 5$ and $f(1) = -4$.

17. Given the vertical position function $y(t) = 2t^3 - 3t^2 - 12t + 11$, $t \geq 0$, t is in minutes, $y(t)$ is in feet, find:

- | | | | |
|--|-----------|---|-----------|
| a) $v(t)$ | b) $v(5)$ | c) $a(t)$ | d) $a(3)$ |
| e) when the particle moves down | | f) when the particle moves up | |
| g) when the particle speeds up | | h) when the particle slows down | |
| i) the total distance traveled after 2 minutes | | j) the velocity when the particle hits the ground | |
| k) when the velocity is constant | | | |

18. Given the position function $s(t) = \frac{4}{3}t^3 - 2t^2 - 8t$, $t \geq 0$, t is in seconds, $s(t)$ is in inches, find:

- | | | | |
|--|-----------|--|-----------|
| a) $v(t)$ | b) $v(3)$ | c) $a(t)$ | d) $a(4)$ |
| e) when the particle moves in the positive direction | | f) when the particle moves in the negative direction | |
| g) when the particle speeds up | | h) when the particle slows down | |
| i) the total distance traveled after 3 seconds | | j) the velocity when the particle hits the ground | |