

Physics 303 Math Review Sheet

Name: **KEY**

Evaluate the following derivatives and integrals for some practice. Turn it in on Tuesday with your other homework. Please make sure to show your work.

1. $\frac{d}{dx} (12x^2 - 3x + 2) =$

$24x - 3$

2. $\frac{d}{dx} (\frac{5}{x} + \sqrt{x} - 0.3x^3)$

$-\frac{5}{x^2} + \frac{1}{2\sqrt{x}} - 0.9x^2$

3. $\frac{d}{dx} (\frac{x^2}{\sqrt{x^2}}) =$

$\frac{d}{dx} (\frac{x^2}{x}) = \frac{d}{dx} (x) = 1$

4. $\frac{d}{dx} (\sin(3x))$

$3 \cos(3x)$

5. $\frac{d}{dx} (\cos(2x) \exp\{-3x\})$

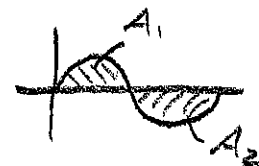
$-2\sin(2x)e^{-3x} - 3e^{-3x}\cos(2x)$

6. $\int 8x^2 + 3x - 12dx$

$\frac{8}{3}x^3 + \frac{3}{2}x^2 - 12x + C$

7. $\int_0^{2\pi} \sin(x) dx = 0 \rightarrow$

$|A_1| = |A_2|$
and $A_2 < 0$



8. $\int_0^{10} 10 \exp\{-2x\} dx$

$-5e^{-2x} \Big|_0^{10} = 5 - \frac{5}{e^{20}} \approx 5$

9. $\int_1^5 \frac{dx}{\sqrt{9+x^2}}$

$\ln(x + \sqrt{x^2+9}) \Big|_1^5 = 0.96$

10. $\int_{-3}^3 2x^2 dx$

$= \left[\frac{2}{3} x^3 \right]_{-3}^3$

$= 36$

