Extra Credit Assignment #6   <u>Due 5/16</u>

Complete these integrals - Check answers on 2 of them

1) $\int \cos^7 \theta \sin \theta \, d\theta$

2) $\int \sin(7\theta) \cos(4\theta) \, d\theta$

3) $\int e^{7x} \cos(4x) \, dx$

4) $\int \dfrac{x^3}{\sqrt[4]{8-x^4}} \, dx$

5) $\int \dfrac{x}{\sqrt{x^2-36}} \, dx$

1) A rock is thrown upward from a 96-ft high cliff at 80 $^{ft}/_{sec}$. Assuming the rock misses the cliff on the way back down, write functions for $a(t)$, $v(t)$, and $h(t)$.

    a) How long does it take for the rock to reach its highest height?

    b) What is the highest height?

    c) How long does it take for the rock to hit the ground?

    d) With what velocity does it hit the ground?

2) Use Partial Fractions: $\displaystyle\int \frac{5}{x^2+6x+8}\,dx$

3) Use Tabular: $\displaystyle\int (5x^2+3x)e^{4x}\,dx$

4) Use Trig Substitution: $\displaystyle\int \frac{x}{\sqrt{49+x^2}}\,dx$

5) Use Substitution: $\displaystyle\int \frac{\cos x}{\sqrt{\sin x}}\,dx$

1) Substitution: $\int \cos^{10}\theta \sin\theta \, d\theta$

2) Tables: $\int \cos(10\theta) \sin\theta \, d\theta$

3) Trig Substitution: $\int \frac{1}{(\sqrt{x^2+100})^3} \, dx$

4) Tabular: $\int x^3 e^{5x} \, dx$

5) Substitution: $\int x^5 \sqrt{x^6 - 5} \, dx$

6) Partial Fractions: $\int \frac{3x+2}{(x-5)(x+6)} \, dx$

7) $\int (x^2 - 3)^2 \, dx$

8) $\int \left(\sqrt[3]{x^4} + \frac{7}{x} + e^{3x} \right) dx$