M175 - 04 EXAM 2 SPRING 2012 Answer key Ver A

1. a) $a_5 = 256$, $a_6 = 1024$

b) $a_n = 4^{n-1}$

c) $a_1 = 1$, $a_{n+1} = 4a_n$

2. $\{a_n\}$ converges to e^3.

3. $S(4) = \frac{\pi}{12}(0 + 4(1) + 2(0) + 4(-1) + 0) = 0$.

4. $\int_0^\infty e^{-3x}\,dx$ converges to $1/3$.

5. a) $\frac{x}{4\sqrt{4-x^2}} + C$ (trig subs $x = 2\sin\theta$)

b) $-\ln|x| - \frac{2}{x} + \ln|x+1| + C$ or $\ln\left|1+\frac{1}{x}\right| - \frac{2}{x} + C$ (partial frac; repeated linear factor)

c) $\ln|x| - \frac{1}{2}\ln|x^2+9| + C$ or $\ln\left|\frac{x}{\sqrt{x^2+9}}\right| + C$ (partial frac, irreducible quad. factor)

d) $2\left[\frac{(x+2)^{3/2}}{3} - 2\sqrt{x+2}\right] + C$. (subs: $u = \sqrt{x+2}$)

6. $1/y = \cos t + 3$ or $y = \frac{1}{\cos t + 3}$

7. a) A b) B c) B d) A e) A.