Some Notes For Calculus II Final Review

3a) $A_{removed} = \sum_{n=0}^{\infty} \frac{A \cdot 3^n}{4^{n+1}} = A$ $\quad L = 3s + \sum_{n=1}^{\infty} \frac{3^n}{2^n} s$ diverges.

4) $\int \sin\sqrt{x}\,dx = -2\sqrt{x}\cos\sqrt{x} + 2\sin\sqrt{x} + C$

5) $\mathcal{L}[1] = \frac{1}{p}$ $\quad \mathcal{L}[x] = \frac{1}{p^2}$ $\quad \mathcal{L}[e^{5x}] = \frac{1}{p-5}$

6) 3

7) $\frac{1}{2}$

8) a) $T(x) = \sum_{n=0}^{\infty} \frac{x^n}{n!}$ $\quad$ b) $T(x) = \sum_{n=0}^{\infty} \frac{(-1)^n x^{3n}}{n!}$ converges absolutely for all x.

c) $\int_0^{.2} e^{-x^3} dx \approx .1996$ with error $< \frac{.2^7}{7 \cdot 2!}$

9) a) False. Consider $a_n = \frac{1}{n}$.

b) True. This is a theorem.

c) False. Consider $a_n = \frac{(-1)^n}{n}$

d) False. Consider $a_n = \frac{1}{n}$

e) True. interval of convergence rules.

f) False

g) $f'''(0) = 2$

h) $g(x) = \frac{1}{5-x}$ since its interval of convergence contains $(-2, 2)$

10) a) $T(x) = \sum_{n=0}^{\infty} (-1)^n (n+1) c x^n$

b) Use a 0^{th} degree Taylor polynomial: $T_0\left(\frac{h}{R}\right) = mg$!