Homework 3 - Due 10:00 AM on Thursday August 8
Solutions should be clear and organized. Make sure you justify your work.

Sequence Practice

Make sure to justify your solution for each problem. Determine wheter the sequence converges or diverges. If it converges, fint its limit.

1. $a_n = \frac{7+15n^4}{136-22n^3+47n^4}$

2. $a_n = \frac{3^{n+4}}{5^n}$

3. $a_n = \sqrt{\frac{n-14}{7n+1}}$

4. $a_n = ne^{-n}$

5. $\{\frac{1}{1}, \frac{1}{3}, \frac{1}{2}, \frac{1}{4}, \frac{1}{3}, \frac{1}{5}, \frac{1}{4}, \frac{1}{6}, ...\}$

6. $a_n = \frac{1+2+3+...+(n-1)}{n!}$

7. $a_n = \frac{\cos(n)}{n^2}$

8. $a_n = \frac{2+3^n}{2+3^{n+1}}$

Double Integral Practice

9. $\int_0^3 \int_0^1 (16 - x^2 - 3y^2)\, dydx$

Change of Variables

10 . Prove that the change of variables formula from rectangular to polar coordinates is $dx\, dy = r\, dr\, d\theta$.