**Name:**

**Math 10a**
October 16, 2014
Quiz #5

1. Do the following series converge or diverge? Justify your answer.

   (a) (2 points)

$$1 + \frac{1}{2} + \frac{1}{6} + \frac{1}{24} + \frac{1}{120} + \cdots + \frac{1}{n!} + \cdots$$

   (b) (2 points)

$$\sum_{k=0}^{\infty} \frac{(-1)^k k}{(2k)!}.$$

2. (1 point) Write down a series of rational numbers converging to $e$.

3. (3 points) What is the radius of convergence of the Taylor series of $\frac{1}{1-x}$ centered at $x = 0$?

4. (2 points) What is the area of the region bounded by the curve $y = x^2$ and the line $y = 1$? You are welcome to use the fact that $\int_0^1 x^2 dx = \frac{1}{3}$.