

## MATH 130A Review: Euler Number and Limits

---

1. Determine the exact limit value of the expression (Hint: write the expression using  $\Sigma$ -notation)

$$1 + \frac{i}{1!} + \frac{-1}{2!} + \frac{-i}{3!} + \frac{1}{4!} + \frac{i}{5!} + \frac{-1}{6!} + \cdots$$

**Solution:**

$$\sum_{n=0}^{\infty} \frac{1}{n!} (i)^n = e^i$$

2. Determine the exact limit value of the expression

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{2n}\right)^n$$

**Solution:**

$$\lim_{n \rightarrow \infty} \left(1 + \frac{\frac{1}{2}}{n}\right)^n = e^{\frac{1}{2}}$$