

Quiz 13 — November 17, 2010 – Section 10 – 11:15 – 12:05

Find the sum of the series $3 + \frac{9}{2!} + \frac{27}{3!} + \frac{81}{4!} + \dots$.

Answer. We know that $e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!}$ for all x . It follows that

$$1 + 3 + \frac{9}{2!} + \frac{27}{3!} + \frac{81}{4!} + \dots = e^3;$$

so,

$$\boxed{3 + \frac{9}{2!} + \frac{27}{3!} + \frac{81}{4!} + \dots = e^3 - 1.}$$