hw4-howard

Tuesday, February 1, 2022 2:50 PM

Problem 3:

(1) $N=4$

$$\sum_{j=1}^{1} \frac{1}{j^2} = \frac{1}{1^2} = 1$$

$$\sum_{j=1}^{2} \frac{1}{j^2} = \frac{1}{1^2} + \frac{1}{2^2} = \frac{1}{1} + \frac{1}{4} = 1.25$$

$$\sum_{j=1}^{3} \frac{1}{j^2} = \frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} = \frac{1}{1} + \frac{1}{4} + \frac{1}{9} = 1.36\overline{1}$$

$$\sum_{j=1}^{4} \frac{1}{j^2} = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} = \frac{1}{1} + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} = 1.423\overline{61}$$

Problem 4:

$\{n!\}$

$1! = 1$

$2! = 2 \cdot 1 = 2$

$3! = 3 \cdot 2 \cdot 1 = 6$

$4! = 4 \cdot 3 \cdot 2 \cdot 1 = 24$

$5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$

Problem 5 Scratch work:

$$\sum_{n=0}^{N} \frac{1}{n!}$$

$N = 4$

$\frac{1}{0!} = \frac{1}{1} = 1$

$\frac{1}{1!} = \frac{1}{1} = 1$ (+) $= 2$

$\frac{1}{2!} = \frac{1}{2} = .5$ $\rightarrow 2.5$

$\frac{1}{3!} = \frac{1}{6} = 1.1\overline{6}$ $\rightarrow 2.6\overline{6}$

$\frac{1}{4!} = \frac{1}{24} = 0.041\overline{6}$ $\rightarrow \approx 2.70833$