

Homework Assignment for Chap 05

1. Section 5.2: Problems 33, 35, 39, 45.
2. Section 5.3: Problems 1, 31, 35, 36, 39, 40.
3. Section 5.4: Problems 7, 11, 13, 19, 23, 41, 43, 45, 51, 69, 73.
4. Section 5.5: Problems 11, 23, 36, 37, 45, 49, 55.
5. Section 5.6: Problems 53, 55, 56, 58, 67, 71, 73.
6. (s5.2-extra1) Evaluate

$$\lim_{n \rightarrow \infty} \sum_{k=1}^{\frac{n}{2}} \frac{1}{n} \sqrt{1 - \left(\frac{k}{n}\right)^2}$$

Hint: What is the area of a circle? what does it have to do with this problem?

7. (s5.2-extra2) Use the binomial expansion for $(k+1)^\ell$ to show by induction that

$$\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{1}{n} \left(\frac{k}{n}\right)^\ell = \frac{1}{\ell+1}$$

where ℓ is a positive integer.

Hint: $(k+1)^{\ell+1} = k^{\ell+1} + (\ell+1)k^\ell + \dots$.

8. (s5.2-extra1) Evaluate

$$\lim_{n \rightarrow \infty} \sum_{k=1}^{\frac{n}{2}} \frac{1}{n} \sqrt{1 - \left(\frac{k}{n}\right)^2}$$

Hint: What is the area of a circle? what does it have to do with this problem?

9. (s5.5-extra1) Evaluate

$$\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{1}{n} \sin\left(\frac{k}{n}\right).$$