

MA 2733

Worksheet 4 – September 15-16, 2015

Name _____

1. Find $\sum_{n=2}^{\infty} \sin^n(2\pi/3)$ and $\sum_{n=5}^{\infty} \sin^n(3\pi/2)$.

2. Write the repeating decimal $0.\overline{53} = 0.535353\dots$ as a geometric series, and then as a fraction.

3. For what values of x does it make sense to define a function $f(x) = \sum_{i=0}^{\infty} x^i$?

4. Fun with inequalities

(a) Explain in 1-2 sentences why $\frac{1}{n} \geq \frac{1}{n^2} \geq \frac{1}{3n^2}$ for any $n \geq 1$.

(b) Explain in 1-2 sentences why $\frac{1}{n^2} \leq \frac{1}{n^2 - \pi}$ for $n \geq 2$.

(c) Explain in 1-2 sentences why $\frac{2}{n^2} \geq \frac{1}{n^2 - \pi}$ when n is large enough. How large is “large enough”?