The Terrific Trio for Fall, 2012

Coeficients of the $e^{sin(x)}$ Power Series[1]

Investigate the properies of the coefficients (b_n) of this series. Is there more than one 0 coeficient? What can be said about the magnitude of the $a_n = b_n/n!$ sequence? Are there 4 consecutive terms a_n of the same sign?

Some Series![2]

Investigate the series

$$\sum_{n=1}^{\infty} \frac{1}{n^{2+\sin(n)}}.$$

Does it converge or diverge, and if it converges, what does it converge to? Then generalize your findings to other series of a similar sort.

Space Filling and Beyond

Investigate the geometric properties of space filling curves mapping $\mathbb{R}$ to $\mathbb{R}^2$. Then generalize to functions mapping $\mathbb{R}^n$ to $\mathbb{R}^m$.

[1] From Josef Pelikan, June, 2011
[2] From Rick Mabry, November, 2011