This homework is due in class on Friday, October 13th. Please complete one of the following problems.

1992 A4 Let $f$ be an infinitely differentiable, real valued function defined on the real numbers. If

$$f\left(\frac{1}{n}\right) = \frac{n^2}{n^2 + 1} \quad n = 1, 2, 3\ldots$$

compute the values of $f^{(k)}(0)$ for $k = 1, 2, 3, \ldots$

1977 A4 Express

$$\sum_{n=0}^{\infty} \frac{x^{2^n}}{1 - x^{2^{n+1}}}$$

as a rational function of $x$.

2007 A1 Find all real values of $\alpha$ so that the curves $y = \alpha x^2 + \alpha x + 1/24$ and $x = \alpha y^2 + \alpha y + 1/24$ are tangent to each other.