Problems. February 1.

1. Let $f(x) = e^{x/2}$.

   a) Find $P_4(x)$, the Taylor polynomial of order 4 for $f(x)$ at $x = 0$.

   b) Use the remainder estimation theorem to estimate the error when $f(x)$ is replaced by $P_4(x)$ on the interval $[-1, 1]$.

2. Find the derivative of order 15 of the function $f(x) = \arctan(x^3)$ at $x = 0$. (Hint: use the Maclaurin series).

3. Find the binomial series for the function $f(x) = (1 - 2x)^{1/3}$. Write out the first four terms of the series.