The point of today's lab is to find an approximation for π.

Let $f(x) = \arctan(x)$ and let $x_0 = 0$.

1. Find $P_3(x)$, $P_5(x)$ and $P_7(x)$.

   Feel free to use Maple to calculate the derivatives of f.

2. Use these to approximate $\arctan(1)$.

   Use Theorem 2 to determine how close your approximations are.

3. What is the exact value of $\arctan(1)$?

   Use your answers to #2 to find approximations for π.

4. Find a general form for $P_n(x)$.

5. Use $P_{50}(1)$ to approximate π.