The goal is to find an approximation for π using Taylor polynomials.

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 $\arctan(1)$?

4. Use your answers to #2 and #3 to find approximations for π.

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

6. Use $P_{15}(1)$ to approximate π. How accurate is your approximation?