1. $f(x) = \frac{1}{1-x}$
   $P_n(x) = 1 + x + x^2 + x^3 + x^4 + x^5 + .. + x^n$
2. $f(x) = \cos(x)$
   $P_n(x) = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!}..$
3. $f(x) = \sin(x)$
   $P_n(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!}..$
4. $f(x) = e^{2x}$
   $P_n(x) = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + .. + \frac{x^n}{n!}$
5. $f(x) = \frac{1}{(1-x)^2}$
   $P_n(x) = 1 + 2x + 3x^2 + 4x^3 + 5x^4 + 6x^5 + .. + (n+1)x^n$
6. $f(x) = ln(1+x)$
   $P_n(x) = x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + .. + (-1)^{n+1}\frac{x^n}{n}$