

$$N(x) = n_0 + n_1 x + n_2 x^2 + n_3 x^3$$

P.2
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Then $r_4 = n_3$

$$r_3 = n_2 - r_4 d_1$$

$$r_2 = n_1 - r_3 d_1 - r_4 d_0$$

$$r_1 = n_0 - r_3 d_0$$

so any (real) $N(x)$ can be obtained, degree $N = \frac{\text{degree}}{[d^2]} - 1$

Look at

$$A = \left[\begin{array}{cc|cc} 0 & 1 & r & d \\ -d_0 & -d_1 & a & b \\ \hline 0 & 0 & 0 & 1 \\ 0 & 0 & -d_0 & -d_1 \end{array} \right]$$

$$(aI_4 - A)^{-1} \cdot (d(x))^2 =$$