Legendre Polynomials, $P_n(y)$
Orthogonality relations:

$$\int_{-1}^{1} P_n(y)P_m(y)dy = 0 \ , \qquad n \neq m$$

$$\int_{-1}^{1} (P_n(y))^2 dy = \frac{2}{2n+1}$$

First few:

$$\begin{aligned}
P_0 &= 1 \\
P_1 &= y \\
P_2 &= \frac{3}{2}\,y^2 - \frac{1}{2} \\
P_3 &= \frac{5}{2}\,y^3 - \frac{3}{2}\,y \\
P_4 &= \frac{35}{8}\,y^4 - \frac{15}{4}\,y^2 + \frac{3}{8} \\
P_5 &= \frac{63}{8}\,y^5 - \frac{35}{4}\,y^3 + \frac{15}{8}\,y \\
P_6 &= \frac{231}{16}\,y^6 - \frac{315}{16}\,y^4 + \frac{105}{16}\,y^2 - \frac{5}{16} \\
P_7 &= \frac{429}{16}\,y^7 - \frac{693}{16}\,y^5 + \frac{315}{16}\,y^3 - \frac{35}{16}\,y \\
P_8 &= \frac{6435}{128}\,y^8 - \frac{3003}{32}\,y^6 + \frac{3465}{64}\,y^4 - \frac{315}{32}\,y^2 + \frac{35}{128}
\end{aligned}$$

Note: $P_n(y)$ even if n even, odd if n odd.
Polynomials generated using the three-term recursion:

$$(n+1)P_{n+1}(y) - (2n+1)yP_n(y) + nP_{n-1}(y) = 0$$