① $a(n+2) = 5a(n+1) - 6a(n)$ $a(1)=1$ $a(2)=2$

$r^2 - 5r + 6 = 0$ $(r-2)(r-3)$ $r = 2, 3$

$A2^k + B3^k$

$A+B=2$ $A2^2 + B3^2 = 2$

$A2^k + B3^k$

$A = \frac{3^2-2}{3^2-2^2}$

$B = \frac{2-2^2}{3^2-2^2}$

$a_{(k)} = \frac{3^2-2}{3^2-2^2} \cdot 2^k + \frac{2-2^2}{3^2-2^2} \cdot 3^k$

2 i 0.7

i' 210,000

ii = 6.28×10^{-6}

iii 0.3017

3 $P_0 = 0$ $P_L = 1$ $1 \leq k \leq L-1$

$A_k = p A_{k+1} + q A_{k-1}$ $p = A+B$, $A = -B$

$pr^2 - r + q$ $r = 1, q/p$

$-B + B(q/p)^2 = \frac{(q/p)^{k-1}}{(q/p)^L - 1}$ → $\frac{1-(q/p)^k}{1-(q/p)^L}$

④ $P_k = 1 + 1/2\, D_{k+1} + 1/2\, D_{k-1}$ $D_0 = 0$ $D_L = 0$

$D_{k+1} - 2D_k + D_{k-1} = 2$

$r^2 - 2r + 1 = 0$ $(r-1)^2$ $A+Bk$

$C(k+1)^2 - 2Ck^2 + C(k-1)^2$

$2C$ $C = -1$ $A+Bk-k^2$

$A = 0$ $Lk - k^2$ $k(L-k)$