Der harmonische Oszillator
a) Eigenwerte der Energie b) Wellenfunktionen c) Wahrscheinlichkeitsdichten.

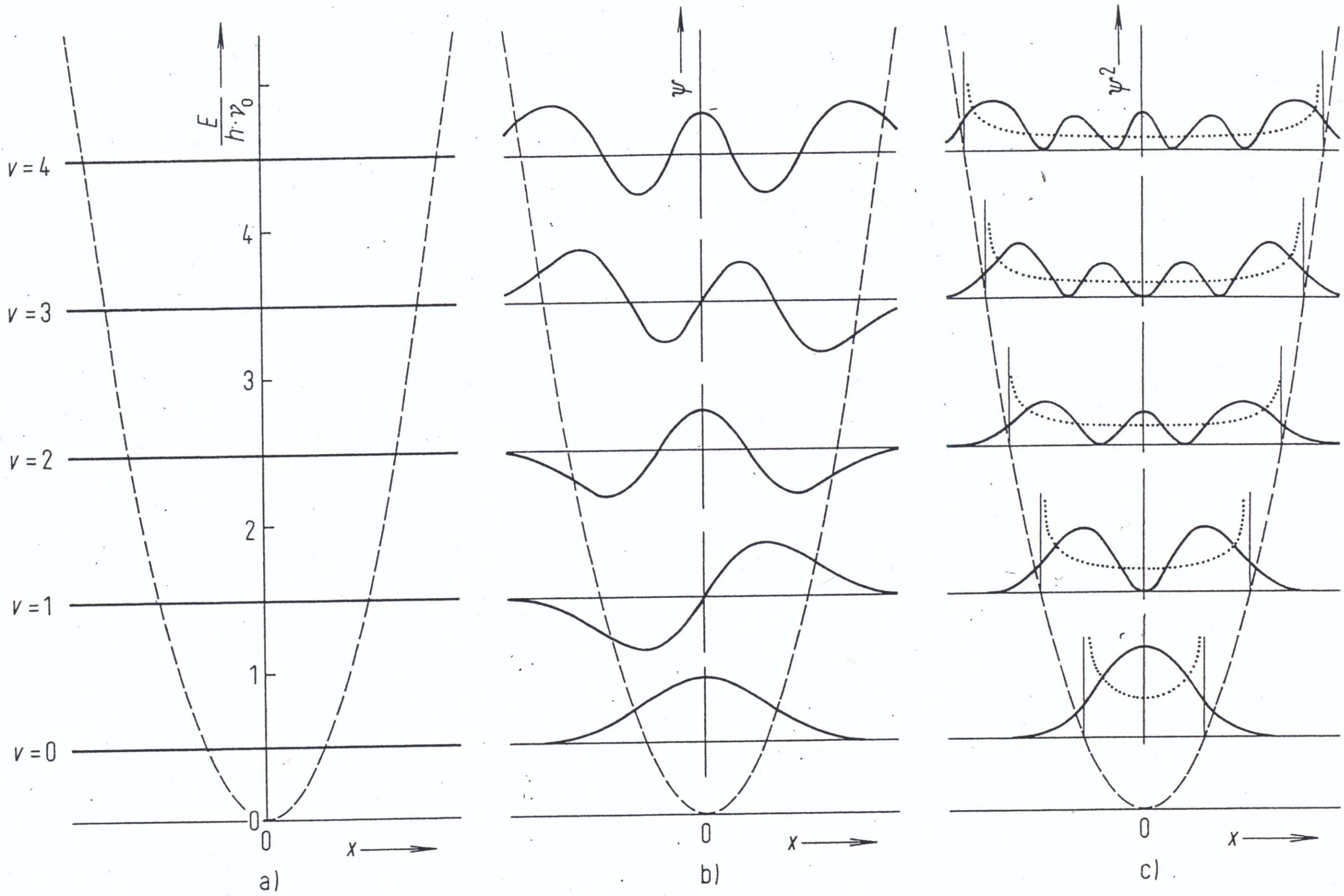

Table: Hermite polynomials

v	$H_v(y)$
0	1
1	$2y$
2	$4y^2 - 2$
3	$8y^3 - 12y$
4	$16y^4 - 48y^2 + 12$
5	$32y^5 - 160y^3 + 120y$
6	$64y^6 - 480y^4 + 720y^2 - 120$
7	$128y^7 - 1344y^5 + 3360y^3 - 1680y$
8	$256y^8 - 3584y^6 + 13440y^4 - 13440y^2 + 1680$

Differential equation: $H_v'' - 2yH_v' + 2vH_v = 0$
Recursion relation: $H_{v+1} = 2yH_v - 2vH_{v-1}$
Orthogonality relation: $\int_{-\infty}^{\infty} H_v H_{v'} e^{-y^2}\, dy = 0$ for $v \neq v'$
Normalization: $\int_{-\infty}^{\infty} H_v^2 e^{-y^2}\, dy = \pi^{1/2} 2^v v!$

Also:
$H_v(y) = (-)^v e^{y^2} \frac{d^v}{dy^v}\left[e^{-y^2}\right]$