N4.2

$\langle x_b | U(T) | x_i \rangle = \sqrt{\frac{m}{2\pi i \hbar T}} \exp\left(\frac{i S_{cl}(t_i)}{\hbar}\right)$ - св. частицы

~~XXXXX~~

$U(x_b, t_b; x_a, t_a) = \sqrt{\frac{1}{2\pi i \hbar} \frac{\partial^2 S_{cl}}{\partial x_a \partial x_b}}\, e^{i S_{cl}/\hbar}$

$S_{cl} = \frac{m}{2T}\left(x_a - x_b\right)^2$

$\frac{\partial S_{cl}}{\partial x_a} = \frac{m}{T}\left(x_a - x_b\right)$

$\frac{\partial^2 S_{cl}}{\partial x_a \partial x_b} = \frac{m}{T} \Rightarrow U = \sqrt{\frac{m}{2\pi i \hbar T}} \exp\left(\frac{i S_{cl}}{\hbar}\right)$

$\Rightarrow F(T) = \sqrt{\frac{m}{2\pi i \hbar T}}$

N4.1

Кл. $S_{cl} = \frac{m\omega}{2\sin(\omega T)}\left[\left(x_a^2 + x_b^2\right)\cos(\omega T) - 2 x_a x_b\right]$ $T = t_b - t_a$

$\frac{\partial^2 S_{cl}}{\partial x_a \partial x_b} = \frac{m\omega}{2\sin\omega T}\left[-2\right] = -\frac{m\omega}{\sin\omega T}$

$\Rightarrow U = \sqrt{\frac{1}{2\pi i \hbar} \frac{-m\omega}{\sin\omega T}}\, e^{i S_{cl}/\hbar} \Rightarrow F = \sqrt{\frac{i m\omega}{2\pi\hbar \sin\omega T}}$