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Assignment - 3

Naimeesh Narayan Tiwari

(Q1) $H(x,p) = \frac{1}{2}kx^2 + \frac{p^2}{2m}$

$$\frac{\partial H}{\partial x} = -F = kx \quad \text{— (1)}$$

$$\frac{\partial H}{\partial p} = p/m = v \quad \text{— (2)}$$

$$= \frac{dx}{dt}$$

$$\frac{dp}{dt} = F = -kx$$

$$m\frac{d^2x}{dt^2} = -kx$$

$$\therefore \frac{d^2x}{dt^2} = \frac{-k}{m}x = -\omega^2 x$$

$\omega = \sqrt{k/m}$ (here)

on solving ~~[illegible]~~,

$$x = A\sin\omega t$$

$$v = A\omega\cos\omega t$$