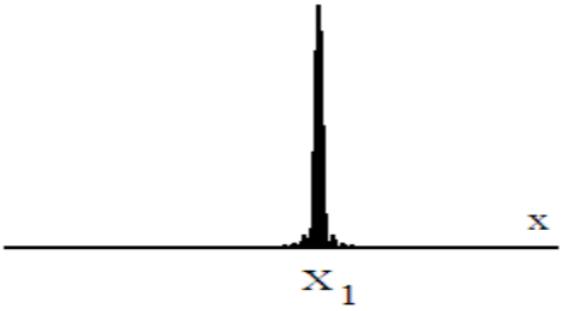
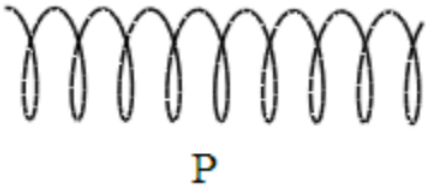
1.23: Very Brief Relationship Between the Coordinate and Momentum Representations

A quon has position x_1 : $|x_1\rangle$

Coordinate space ⇔ Momentum space

$$\langle x|x_1\rangle = \delta(x - x_1) \qquad \langle p|x_1\rangle dp] \int \langle p|x\rangle\langle x|x_1\rangle dx\langle p|x_1\rangle = \exp\left(-\frac{ipx_1}{\hbar}\right)$$





A quon has momentum p_1 : $|p_1\rangle$

Coordinate space ⇔ Momentum space

$$\langle x|p_1\rangle = \exp\left(\frac{ip_1x}{\hbar}\right) \qquad \int \langle p|x\rangle\langle x|p_1\rangle dx\langle p|p_1\rangle = \delta(p - p_1)$$