ii) Yes, by defn, since the spectrum of an operator $\hat{A}$ is precisely the set of real numbers that represent the possible outcomes of a measurement of A, represented by the operator $\hat{A}$

2/2

iii) The spectrum of the position operator is the set of all real numbers, but the spectrum of the free particle energy operator is the set of non-negative real numbers, hence these two spectra are not identical.

2/2

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