An electron is in a state $(1/2)\,|3\text{cm}\rangle - (i\sqrt{3}/2)\,|4\text{cm}\rangle$.
(The lengths are distances along the x-axis from some agreed-upon origin).
If we measure the electron's position, we are most likely to find a result of

A) 3cm

B) 4cm

C) $(3/2 - 2i\sqrt{3})$ cm

D) $(3/2 + 2\sqrt{3})$ cm

E) anywhere between 3cm and 4cm

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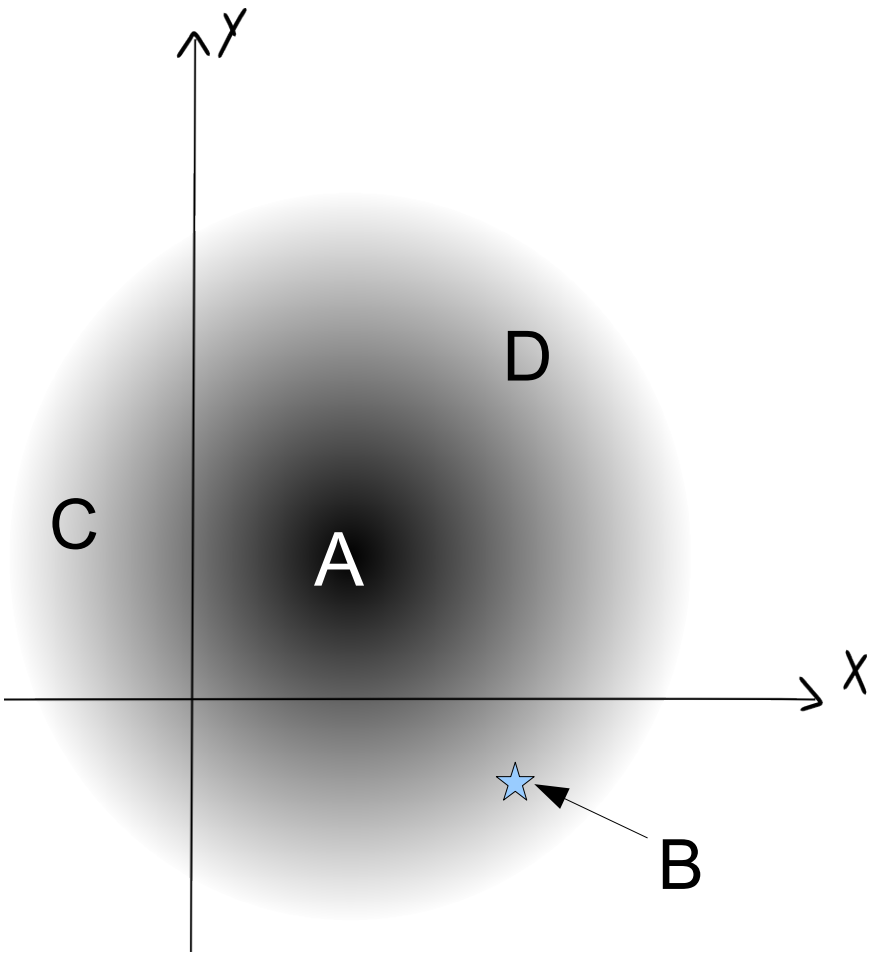
prob of detection at $|3cm\rangle$ is $|1/2|^2 = 1/4$
prob of detection at $|4cm\rangle$ is $|i\sqrt{3}/2|^2 = 3/4$
the latter is bigger, so
that's where the electron is most likely to be found

An electron is in a state given by the wavefunction on the right. (darker region means Ψ is larger)

A measurement finds the electron at the spot marked with ☆

Shortly after, the measurement of position is repeated. Where is the electron is most likely to be found second time around?



E) - impossible to predict, since everything is random

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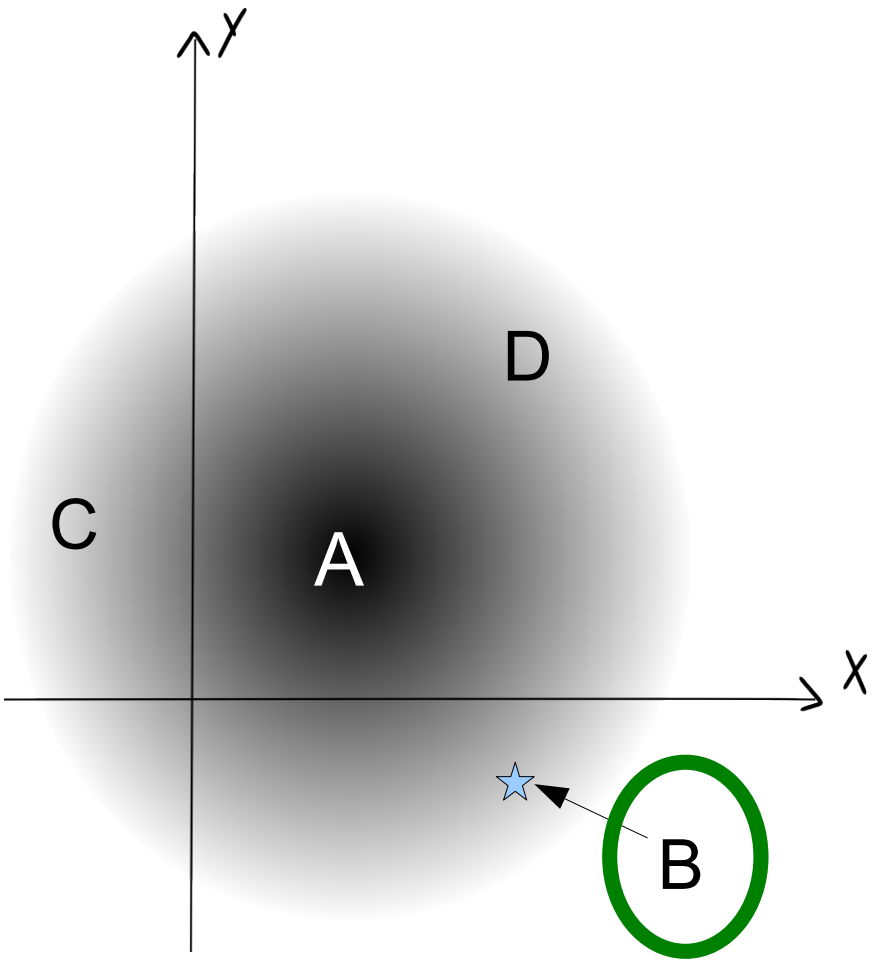
once the particle is found at the star it the first measurement, it must be detected there in all subsequent measurements



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Immediately repeated measurements of an electron's position give the same result. This implies that

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When a measurement is made, the quantum state changes to an eigenstate of the measurement