PHYS2581 Foundations2A: QM2 examples class9

(a) $\psi_1$

(b) $b_1$ with probability 9/25, $b_2$ with probability 16/25

(c) invert to get $\phi_1 = (3\psi_1 + 4\psi_2)/5$ and $\phi_2 = (4\psi_1 - 3\psi_2)/5$.

if measured $b_1$ (with prob 9/25) then state is $\phi_1$ so prob $a_1$ is 9/25 so prob this way is $(9/25)^2$

if measured $b_2$ (with prob 16/25) then state is $\phi_2$ so prob $a_1$ is 16/25 so prob this way is $(16/25)^2$

so total prob is sum of the two probabilities $(9/25)^2 + (16/25)^2$

(d) 1 because we haven't disturbed the wavefunction since the measurement of $A$ gave $a_1$

(e) its the measurement that collapses the wavefunction! not your knowledge!! so its still $(9/25)^2 + (16/25)^2$