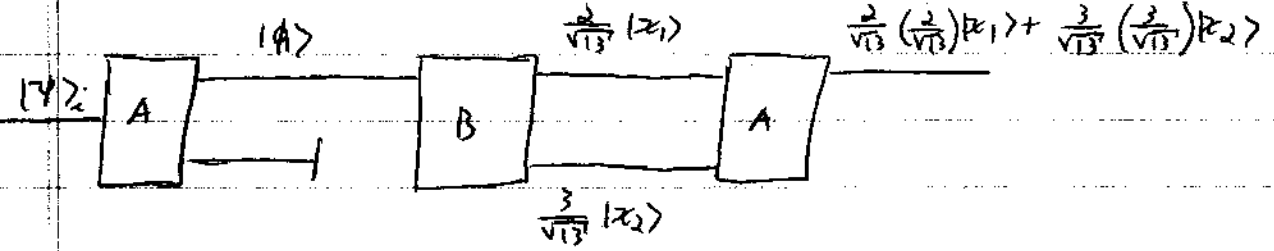
QM F'03 #4

$A|\psi\rangle = a_1|\phi_1\rangle + a_2|\phi_2\rangle$; $B|\psi\rangle = b_1|x_1\rangle + b_2|x_2\rangle$

$|\phi_1\rangle = \frac{1}{\sqrt{13}}(2|x_1\rangle + 3|x_2\rangle)$; $|\phi_2\rangle = \frac{1}{\sqrt{13}}(3|x_1\rangle - 2|x_2\rangle)$



So $|\psi\rangle_f = \frac{4}{13}|x_1\rangle + \frac{9}{13}|x_2\rangle$

And the probability is $\frac{4^2+9^2}{13^2} = \frac{16+81}{169} = \frac{97}{169}$