Result

To find probability for C_n we find the absolute square value

$$|C_n|^2$$

$$\therefore \frac{|a+b|^2}{(\sqrt{2})^2} : \frac{\hbar}{2} \qquad \frac{|a-b|^2}{(\sqrt{2})^2} : -\frac{\hbar}{2}$$

$$\frac{|a+b|^2}{(2)} : \frac{\hbar}{2} \qquad \frac{|a-b|^2}{(2)} : -\frac{\hbar}{2}$$

meaning $\frac{\hbar}{2}$ probability will be some value $\frac{|a+b|^2}{(\sqrt{2})^2}$

and $-\frac{\hbar}{2}$ probability will be some value $\frac{|a-b|^2}{(\sqrt{2})^2}$