Sum of two signals

$$V(t) = a_1 e^{(jX_1)} + a_2 e^{(jX_2)}, \quad X_i = 2\pi f t + \phi_i$$

let

$V_1(t) = a_1 e^{jX_1}$ & $V_2(t) = a_2 e^{jX_2}$ $\quad \phi_2 - \phi_1 = 0$

$\phi_2 - \phi_1 = \pi$

$V_1(t) = a_1 \cos X_1$ & $V_2 = a_2 \cos X_2$

$\Rightarrow a_1 \cos(2\pi f_1 t)$ $\quad \Rightarrow a_2 \cos(2\pi f_2 t)$

↑ positive & negative

real

$V_1(t) + V_2(t) = V_{re} = a_1 e^{j(2\pi f_1 t)} + a_2 e^{j(2\pi f_2 t)}$

imagine

$V_1(t) + V_2(t) : V^* = a_1 e^{-j(2\pi f_1 t)} + a_2 e^{-j(2\pi f_2 t)}$

$$VV^* = a_1^2 + a_1 a_2 + a_2^2 + a_2 a_1 = (a_1 + a_2)^2$$

Which shows constructive interference as in the amplitudes will be added and not destroy each other.