For "everyday" sound pressure levels $SPL = L_p = 20\log_{10}\left(p_{atm}/p_o\right) \ll 134\,dB$, corresponding to sound over-pressure amplitudes in "***free air***" at NTP of $\left|\tilde{p}\left(\vec{r},t\right)\right| \ll 100\;RMS\;Pascals$, the ***principle of linear superposition*** holds, such that the total/resultant complex over-pressure and longitudinal particle velocity amplitudes respectively are:

$$\tilde{p}_{tot}\left(x,t\right) = \tilde{p}_A\left(x,t\right) + \tilde{p}_B\left(x,t\right) \;=\; \tilde{A}e^{i(\omega t - kx)} + \tilde{B}e^{i(\omega t + kx)} \quad (Pascals)$$

and:

$$\tilde{u}^{\parallel}_{tot}\left(x,t\right) = \tilde{u}^{\parallel}_A\left(x,t\right) + \tilde{u}^{\parallel}_B\left(x,t\right) \;=\; \tilde{u}^{\parallel}_{A_o}e^{i(\omega t - kx)} + \tilde{u}^{\parallel}_{B_o}e^{i(\omega t + kx)} = \frac{\tilde{A}}{\rho_o c}e^{i(\omega t - kx)} - \frac{\tilde{B}}{\rho_o c}e^{i(\omega t + kx)}\,(m/s)$$

We can recast the above equations in terms of the dimensionless complex variable:

$$\tilde{R} \equiv \frac{\tilde{B}}{\tilde{A}} = \frac{\left|\tilde{B}\right|e^{i\varphi_B^o}}{\left|\tilde{A}\right|e^{i\varphi_A^o}} = \frac{\left|\tilde{B}\right|}{\left|\tilde{A}\right|}e^{i\left(\varphi_B^o - \varphi_A^o\right)} = \left|\tilde{R}\right|e^{i\left(\varphi_B^o - \varphi_A^o\right)} = \left|\tilde{R}\right|e^{i\Delta\varphi_{BA}^o} \text{ where: } \Delta\varphi_{BA}^o \equiv \varphi_B^o - \varphi_A^o$$

Thus:

$$\tilde{p}_{tot}\left(x,t\right) = \tilde{A}\left[e^{i(\omega t - kx)} + \left|\tilde{R}\right|e^{i(\omega t + kx)}\cdot e^{i\Delta\varphi_{BA}^o}\right] = \tilde{A}\left[1 + \left|\tilde{R}\right|e^{i\left(2kx + \Delta\varphi_{BA}^o\right)}\right]e^{i(\omega t - kx)}$$

and:

$$\tilde{u}^{\parallel}_{tot}\left(x,t\right) = \frac{\tilde{A}}{\rho_o c}\left[e^{i(\omega t - kx)} - \left|\tilde{R}\right|e^{i(\omega t + kx)}\cdot e^{i\Delta\varphi_{BA}^o}\right] = \frac{\tilde{A}}{\rho_o c}\left[1 - \left|\tilde{R}\right|e^{i\left(2kx + \Delta\varphi_{BA}^o\right)}\right]e^{i(\omega t - kx)}$$

We first calculate the ***magnitudes*** of the complex total/resultant over-pressure $\left|\tilde{p}_{tot}\left(x,t\right)\right|$ and longitudinal particle velocity $\left|\tilde{u}^{\parallel}_{tot}\left(x,t\right)\right|$:

$$\begin{aligned}
\left|\tilde{p}_{tot}\left(x,t\right)\right| &\equiv \sqrt{\tilde{p}_{tot}\left(x,t\right)\cdot\tilde{p}^*_{tot}\left(x,t\right)} \\
&= \left|\tilde{A}\right|\sqrt{\left(1 + \left|\tilde{R}\right|e^{i\left(2kx + \Delta\varphi_{BA}^o\right)}\right)\cdot\left(1 + \left|\tilde{R}\right|e^{i\left(2kx + \Delta\varphi_{BA}^o\right)}\right)^*} \\
&= \left|\tilde{A}\right|\sqrt{\left(1 + \left|\tilde{R}\right|e^{i\left(2kx + \Delta\varphi_{BA}^o\right)}\right)\cdot\left(1 + \left|\tilde{R}\right|e^{-i\left(2kx + \Delta\varphi_{BA}^o\right)}\right)} \\
&= \left|\tilde{A}\right|\sqrt{1 + \left|\tilde{R}\right|e^{i\left(2kx + \Delta\varphi_{BA}^o\right)} + \left|\tilde{R}\right|e^{-i\left(2kx + \Delta\varphi_{BA}^o\right)} + \left|\tilde{R}\right|^2} \\
&= \left|\tilde{A}\right|\sqrt{1 + \left|\tilde{R}\right|\left\{e^{i\left(2kx + \Delta\varphi_{BA}^o\right)} + e^{-i\left(2kx + \Delta\varphi_{BA}^o\right)}\right\} + \left|\tilde{R}\right|^2} \\
&= \left|\tilde{A}\right|\sqrt{1 + 2\left|\tilde{R}\right|\cos\left(2kx + \Delta\varphi_{BA}^o\right) + \left|\tilde{R}\right|^2}
\end{aligned}$$