3.) **<u>The most general case</u>:** A single monochromatic traveling plane wave (emitted from a sound source *e.g*. located at $x = -\infty$) propagating in the +*ve* *x*-direction and reflects, at normal incidence off of an infinite plane (located at $x = x_o > 0$) of ***<u>arbitrary</u>*** characteristics – *e.g*. it could be a "***<u>passive</u>***" surface that is only partially ***<u>reflecting</u>***/***<u>partially</u>*** ***<u>absorbing</u>*** (hence $|\tilde{R}| < 1$) and in principle could have associated with it *e.g*. a frequency-dependent phase shift upon reflection $-\pi \le \Delta\varphi_{BA}^{o}\left(x = x_o, \omega\right) \le \pi$, thereby producing a reflected wave that propagates in the –*ve* *x*-direction. This situation physically corresponds to the most general $\tilde{R} = |\tilde{R}| e^{i\Delta\varphi_{BA}^{o}}$. If the reflecting surface were "***<u>active</u>***", it is also possible that $|\tilde{R}| > 1$ (!), and depending on the details of the response of the "***active***" reflecting surface, the phase shift could be $-\pi \le \Delta\varphi_{BA}^{o}\left(x = x_o, \omega\right) \le \pi$.