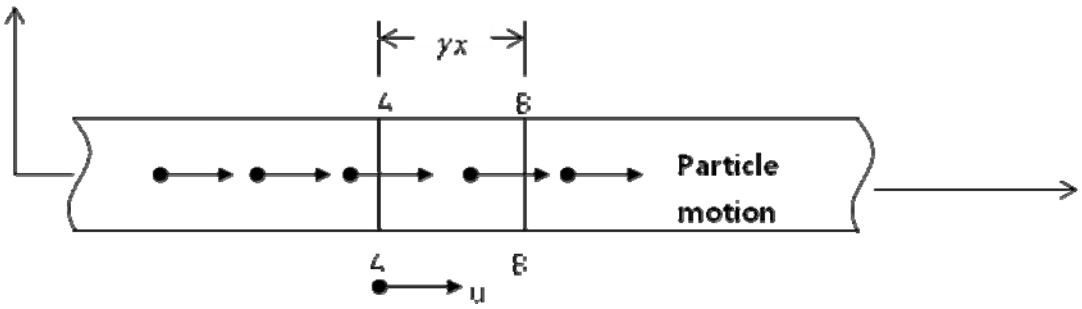
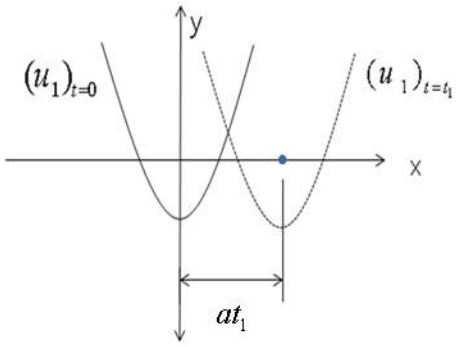
$$u = f(x - at) + g(x + at)$$



① If an instantaneous displacement u applied at A-A', A-A' section experience a tensile stress, and B-B' a compressive stress, as time passed, larger zones would experience the stress caused by the displacement u.

The results would be a tensile-stress wave traveling in the negative x-direction and a compressive wave traveling in the positive x direction.

② Solution : $u = f(x-at)+g(x+at)$ reveals the followings,



Let $u_1 = f(x-at)$

then, at $t=0$ $u_1 = f(x)$

& at $t=t_1$ $u = f(x-at)$: defines an identical curve except that the latter is translated to the right a distance equal to at_1 during the time periods t_1, i.e., at the velocity of $at_1 / t_1 = a$ (physical meaning of a)

- And if $u_2 = g(x+at)$, It moves to the left at the velocity of "a"

Thus,

$u = f(x-at)+g(x+at)$: is the algebraic sum of these two traveling waves