Check it: $\frac{\partial u}{\partial t} = -cF'(x-ct) + cG'(x+ct)$

$\frac{\partial^2 u}{\partial t^2} = c^2 F''(x-ct) + c^2 G''(x+ct)$ ← this equals c^2 times this

$\frac{\partial u}{\partial x} = F'(x-ct) + G'(x+ct)$

$\frac{\partial^2 u}{\partial x^2} = F''(x-ct) + G''(x+ct)$ ← this

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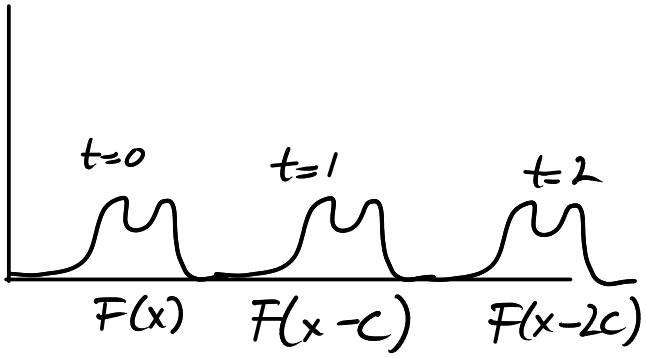
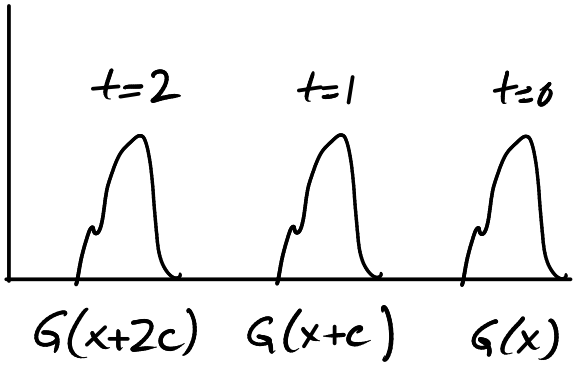
What is $F(x-ct)$?
Shape stays the same, but it translates/shifts to the right at speed c!



$F(x-ct)$ is called a <u>right-moving wave</u>.

What is $G(x+ct)$?
Shape stays the same, but it translates/shifts to the left at speed c!



$G(x+ct)$ is called a <u>left-moving wave</u>.

The general solution is a superposition of right- and left-moving components.
The parameter c is the speed of waves.
For Electromagnetic waves in vacuum, $c = 299\,792\,458$ m/s