Wave Initial Conditions

Your group will discuss one of the waveforms below. If you finish early, move on to another, swapping roles of taskmaster, cynic, & recorder*.

We have discovered a general form for writing the solution to the non-dispersive wave equation. For the following single-frequency waveforms, find the values of the coefficients of the general form that satisfy the following initial conditions:

- $\psi(x, t = 0) = \Omega \sin(kx)$ $\frac{\partial \psi(x,t=0)}{\partial t} = 0$
- $\psi(x, t = 0) = \Omega \sin(kx)$ $\frac{\partial \psi(x,t=0)}{\partial t} = \omega\Omega \cos(kx)$
- $\psi(x, t = 0) = \Omega \cos(kx)$ $\frac{\partial \psi(x,t=0)}{\partial t} = \omega\Omega \sin(kx)$
- $\psi(x, t = 0) = \Omega \sin(kx)$ $\frac{\partial \psi(x,t=0)}{\partial t} = \omega\Omega \sin(kx)$

Predict and discuss how your waveform develops with time, and after your prediction, plot and animate the waveform in Maple (canned program on class page).

A	B	C	D
1			
2			
3			
4			

- It is important to remain on-task and work efficiently in groups. Assign one person (taskmaster) the role of keeping the work on track, avoiding distractions, and maximizing efficiency. Assign another person (cynic) responsibility for questioning the group's decisions and asking why the group understands. Assign a third person (scribe) responsibility for writing down the group's work.

by Janet Tate
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