

Problem Set 6

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1. (a) We know that a wave travelling in the forward direction is given

$$y_f = Ae^{i(kx-\omega t)}$$

- (b) The reflected wave is given

$$y_b = RAe^{i(kx+\omega t)}$$

Thus the complete wave is give

$$y(x, t) = Ae^{i(kx+\omega t)} + RAe^{i(kx-\omega t)}$$

Setting $y(0, t) = 0$ we have

$$y(0, t) = Ae^{ikx}(e^{i\omega t} + Re^{-i\omega t}) \implies R = -1$$

thus that the reflected wave is the has an amplitude opposiute to the direct wave

- (c) If the boundary is free then