

1. Text, 4.12
2. Text, 4.17
3. Consider the equation

$$u_t + au_x - bu_{xxx} = 0$$

where  $x \in \mathbb{R}$ . Suppose at  $t = 0$ ,  $u(x, t) = e^{ikx}$ . Find a solution of the differential equation. Describe the solution as a traveling wave. What is the speed of the wave? How does the speed change as we change the spatial frequency  $k$ ?