

## Exercise 6

Derive the formula for the inhomogeneous wave equation in yet another way.

- (a) Write it as the system

$$u_t + cu_x = v, \quad v_t - cv_x = f.$$

- (b) Solve the first equation for  $u$  in terms of  $v$  as

$$u(x, t) = \int_0^t v(x - ct + cs, s) ds.$$

- (c) Similarly, solve the second equation for  $v$  in terms of  $f$ .
- (d) Substitute part (c) into part (b) and write as an iterated integral.