

## The story so far ...

L7a

General method for tackling linear PDE with suitable b.c.'s:

1. Separate variables

- try  $\phi(x, y) = X(x)Y(y)$

2. Solve resulting eigenvalue problem  
(ODE with b.c.'s)

→ set of separable solutions

3. Build general solution as linear superposition of separable solutions

Use Fourier methods to find coefficients from initial (or final) conditions

(Works because eigenfunctions are orthogonal)