

Suggested problems. Set 3.

- Section 3.2: 2, 6.

- Solve the IVP

$$u_{tt} = c^2 (u_{xx} + u_{yy} + u_{zz})$$

with the conditions

$$u(x, 0) = 0, \quad u_t(x, 0) = 1, \quad |x| \leq a \quad \text{and} \quad 0, |x| > a.$$

What is the behaviour of the solution at point $(0, a/c)$?

- Section 4.1: 1, 2, 5, 6, 9

- Section 2.3: 1, 5, 8, 9

- Section 4.1: 1, 3, 4, 6, 7, 8.

- Section 4.2: 1, 4, 7, 8.

- The potential of a mass distribution with constant surface density on a sphere is defined by

$$u(x) = \gamma \int_{|y|=r} \frac{1}{|x-y|} dS(y), \quad x \in \mathbb{R}^3, \quad \gamma > 0,$$

Determine u .