

Problem 423A

This problem involves a flow laden with solid particles (for example, sand grains in a river, or dust in the wind). The velocity of the particles is denoted by $v(x, t)$ and is a function of position, x , and time, t . The number density, n (number of particles per unit total volume), may also vary with x and t . Using an elemental volume find the differential equation for n and v which results from application of the principle of conservation of particles, that is to say the statement that particles are neither created nor destroyed.