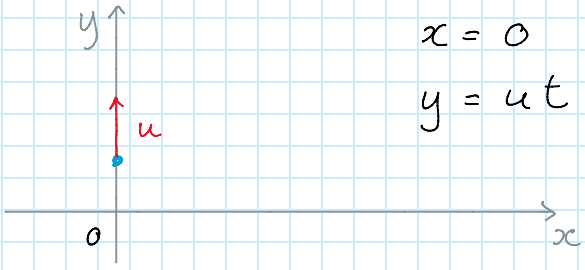
Inertial and non inertial frames

Monday, August 31, 2020 3:35 AM

Problem 1.26 in Taylor

Object moving with constant velocity u along the y axis of the frame S, viewed by two additional frames S' (moving with constant velocity v along x) and S'' (moving with constant acceleration a along x). The goal is to write the object coordinates at the time t in the three frames.

FRAME S

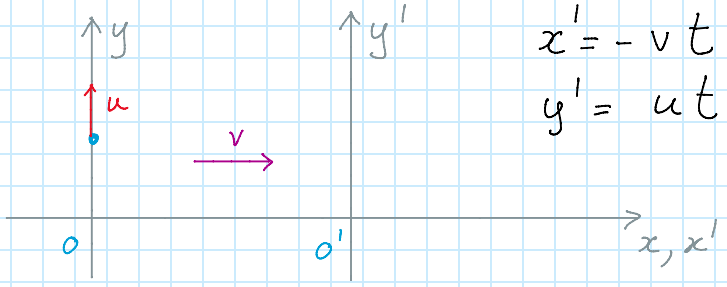


$x = 0$ $\quad \ddot{x} = 0$

$y = ut$ $\quad \ddot{y} = 0$

no acc
no force
INERTIAL

FRAME S'

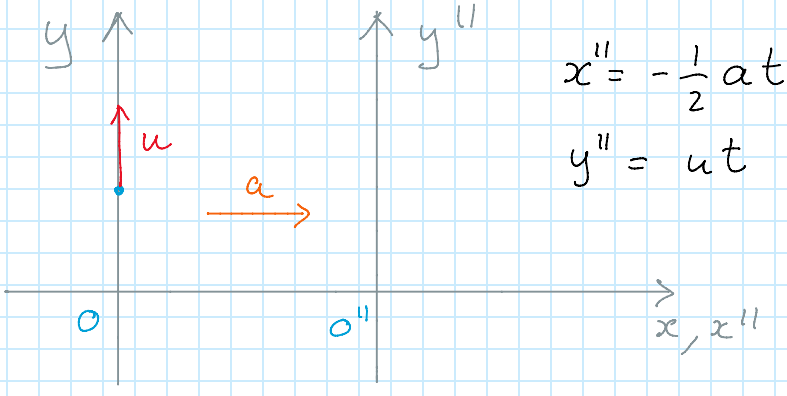


$x' = -vt$ $\quad \ddot{x}' = 0$

$y' = ut$ $\quad \ddot{y}' = 0$

no acc
no force
INERTIAL

FRAME S''



$x'' = -\frac{1}{2}at^2$ $\quad \ddot{x}'' = -a$

$y'' = ut$ $\quad \ddot{y}'' = 0$

no force
acc $\neq 0$
NON INERTIAL