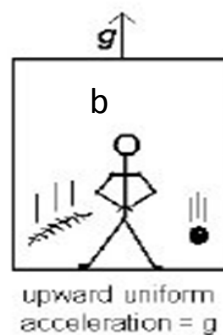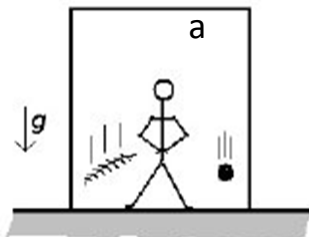# Non Inertial Reference Frames

1. Linear Acceleration:
   Today

2. Rotating Frame: Thursday

   - Centrifugal Force
   - Coriolis Force

Observers a and b both release the ball initially at rest with respect to each of them. The time the ball takes to hit the floor is

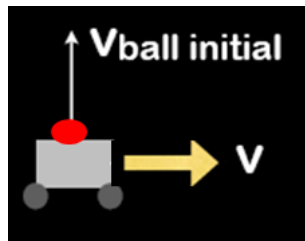resting on ground, in uniform gravitational field g, downwards

a

b

Note: observer b is in free space

upward uniform acceleration = g

A) Longer for a than for b
B) Longer for b than for a
C) The same   D) Do not know

The cart is moving at a constant velocity v. The ball is launched straight upwards from the moving cart, where does it land relative to the cart?
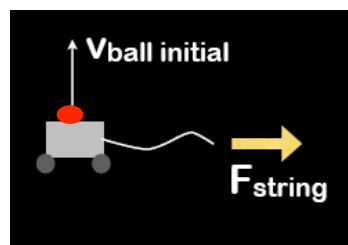
A) In front of the cart
B) On the cart
C) Behind the cart

Note: $v_{ball\ init}$ is drawn with respect to an observer in the cart. Neglect air friction

The cart is pulled to the right with a constant F. At t_0, the ball is launched straight upwards from the moving cart. Where does it land relative to the cart?

A) In front of the cart
B) On the cart
C) Behind the cart

Note: $v_{ball\ init}$ is drawn with respect to an observer in the cart. Neglect air friction

The cart is pulled to the right with a constant F.
At t_0, the ball is launched straight upwards from the moving cart.
Where does it land relative to the cart?

      A) In front of the cart
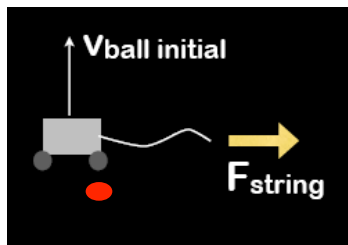   B) On the cart
      C) Behind the cart

Note: $v_{ball\ init}$ is drawn with respect to an observer **in the cart.** Neglect air friction

Challenge: As viewed by an observer on the cart, what *path* does the ball appear to follow?