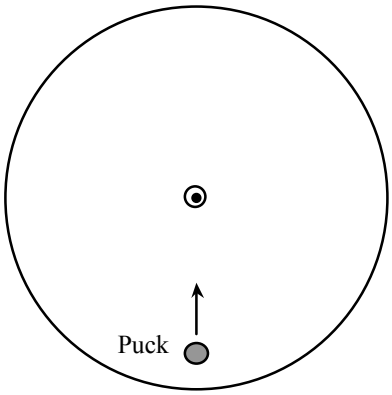
1. A carousel rotates *clockwise* at a constant rate relative to the ground.

   A student sitting on the carousel places a small plastic puck in front of her and gives it a quick shove. *In the frame of the merry-go-round* the puck initially moves directly toward the center of the carousel.

   A. The top view diagram at right shows the carousel, the puck, and the initial velocity of the puck as viewed in the reference frame of the carousel. (Neglect all frictional effects.)

      On the diagram at right, indicate how the trajectory of the puck might look when viewed **in the frame of the carousel.** In particular, show whether the puck will *cross the center of the carousel, pass to the left of it,* or *pass to the right of it.* Explain how you determined your answer.

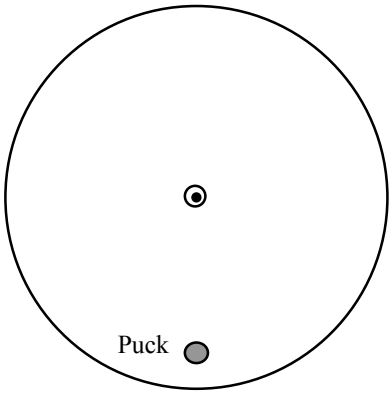


Top view diagram ***in the frame of the carousel***

(Carousel spins *clockwise* relative to the ground)

   B. The top view diagram at right shows the carousel and the puck as viewed in the reference frame of the ground. (Neglect all frictional effects.)

      On the diagram at right, indicate how the trajectory of the puck might look when viewed **in the frame of the ground.** In particular, show whether the puck will *cross the center of the carousel, pass to the left of it,* or *pass to the right of it.* Explain how you determined your answer.



Top view diagram ***in the frame of the ground***

(Carousel spins *clockwise* relative to the ground)

(continued on other side)

2. A pebble is dropped from the top of an empty elevator shaft inside the Empire State Building. The point of release is directly above a point *P* marked on the floor at the bottom of the shaft.

   Taking the rotational motion of the Earth into account, would the pebble land *exactly at point P?* If not, where would it hit the floor (*e.g.,* slightly west of point *P,* slightly east of point *P,* or somewhere else)? Explain your reasoning.