

Unit VIII: Worksheet 2

A woman flying aerobatics executes a maneuver as illustrated in Figure 1 below:

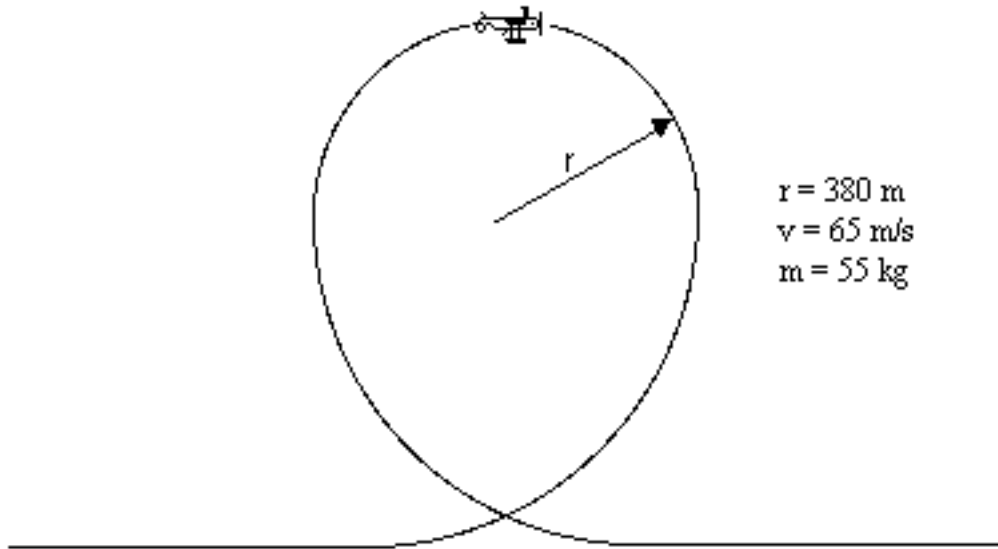


Figure 1

- 1a. Determine the value of the centripetal force acting on the woman flying the airplane when at the top of the loop, as indicated in Figure 1.

- 1b. Construct a quantitative diagram of all relevant forces acting on the woman.

- 1c. Does the woman feel lighter or heavier than normal at this position? Explain.

A popular amusement park ride, Figure 2, operates as follows: riders enter the cylindrical structure when it is stationary with the floor at the point marked "a". They then stand against the wall as the cylinder then begins to rotate. When it is up to speed, the floor is lowered to the position marked "b", leaving the riders "suspended" against the wall high above the floor.

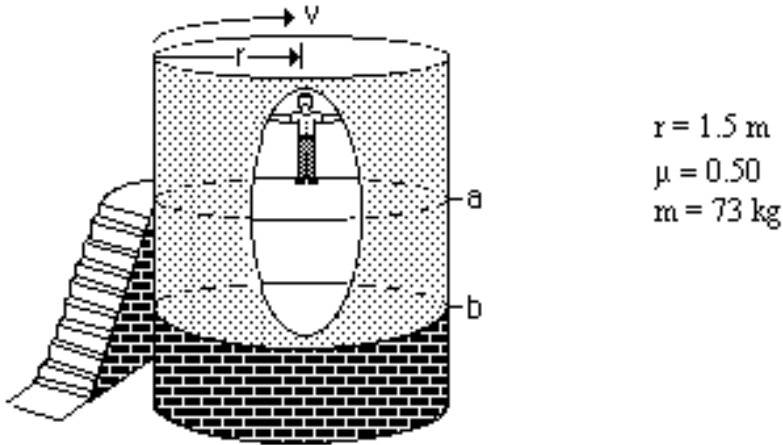


Figure 2

2. What is the maximum period of rotation necessary to keep the riders from sliding down the wall when the floor is lowered from point "a" to point "b"? (Show all of your work and explain your reasoning.)