

Answer on Question #54834-Physics-Mechanics | Kinematics | Dynamics

Mischievous Joey likes to play with his family's lazy susan (this drives Mom crazy because it is an antique). He puts the salt shaker near the edge and tries to spin the tray at a speed so that the shaker just barely goes around without slipping off. Joey finds that the shaker just barely stays on when the turntable is making one complete turn every two seconds. Joey's older sister measures the mass of the shaker to be 67 grams. She also measures the radius of the turntable to be 0.22 m, and she is able to calculate that the speed of the shaker as it successfully goes around in a circle is 0.6908 m/s.

(a) What is the magnitude in newtons of the horizontal part of the contact force on the shaker by the turntable?

(b) What is the magnitude in newtons of the vertical part of the contact force on the shaker by the turntable?

Solution

(a)

$$F_h = \frac{mV^2}{r} = \frac{0.067 \cdot 0.6908^2}{0.22} = 0.15 \text{ N.}$$

(b)

$$F_v = mg = 0.067 \cdot 9.8 = 0.66 \text{ N}$$

