

Name: _____

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2. A curve in a road forms part of a horizontal circle. As a car goes around it at constant speed 14.0 m/s , the total horizontal force on the driver has magnitude 130 N . What is the total horizontal force on the driver if the speed on the same curve is 18.0 m/s instead?

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4. Whenever two *Apollo* astronauts were on the surface of the Moon, a third astronaut orbited the Moon. Assume the orbit to be circular and 100 km above the surface of the Moon, where the acceleration due to gravity is 1.52 m/s^2 . The radius of the Moon is $1.70 \times 10^6 \text{ m}$. Determine (a) the astronaut's orbital speed and (b) the period of the orbit.

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7. A space station, in the form of a wheel 120 m in diameter, rotates to provide an “artificial gravity” of 3.00 m/s^2 for persons who walk around on the inner wall of the outer rim. Find the rate of the wheel’s rotation in revolutions per minute that will produce this effect.

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8. Consider a conical pendulum (Fig. P6.8) with a bob of mass $m = 80.0$ kg on a string of length $L = 10.0$ m that makes an angle of $\theta = 5.00^\circ$ with the vertical. Determine (a) the horizontal and vertical components of the force exerted by the string on the pendulum and (b) the radial acceleration of the bob.



Figure P6.8

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11. A coin placed 30.0 cm from the center of a rotating, horizontal turntable slips when its speed is 50.0 cm/s. (a) What force causes the centripetal acceleration when the coin is stationary relative to the turntable? (b) What is the coefficient of static friction between coin and turntable?