



Figure 4

42. Assuming the radius of the earth is 4,000 mi, use the information from Problem 41 to find the linear velocity of a person standing on the equator.
43. A boy is twirling a model airplane on a string 5 ft long. If he twirls the plane at 0.5 rpm, how far does the plane travel in 2 minutes?
44. A mixing blade on a food processor extends out 3 inches from its center. If the blade is turning at 600 rpm, what is the linear velocity of the tip of the blade in feet per minute?
45. A gasoline-driven lawnmower has a blade that extends out 1 ft from its center. The tip of the blade is traveling at the speed of sound, which is 1,100 ft/sec. Through how many rpm is the blade turning?
46. A  $3\frac{1}{2}$ -inch diskette, when placed in the disk drive of a computer, rotates at 300 rpm. Find the linear velocity of a point 1.5 inches from the center of the diskette.
47. A  $5\frac{1}{4}$ -inch floppy diskette, when placed in the disk drive of a computer, rotates at 360 rpm. Find the linear velocity of a point 2.5 inches from the center of the diskette. Then find the linear velocity of a point 1.25 inches from the center of the diskette.
48. A 5-inch fixed disk in a computer rotates at 3,600 rpm. Find the linear velocity of a point 2 inches from the center of the disk. Then find the linear velocity of a point 1 inch from the center.
49. Figure 4 is a model of the Ferris wheel known as the Reisenrad, or Great Wheel, that was built in Vienna in 1897. The diameter of the wheel is 197 ft, and one complete revolution takes 15 minutes. Find the linear velocity of a person riding on the wheel. Give your answer in miles per hour.
50. Use Figure 4 as a model of the Ferris wheel called Colossus that was built in St. Louis in 1986. The diameter of the wheel is 165 ft. A brochure that gives some statistics associated with Colossus indicates that it rotates at 1.5 rpm. The same brochure also indicates that a rider on the wheel is traveling at 10 mph. Explain why these two numbers, 1.5 rpm and 10 mph, cannot both be correct.
51. How far does the tip of a 12-cm minute hand on a clock travel in 1 day?
52. How far does the tip of a 10-cm hour hand on a clock travel in 1 day?
53. A woman rides a bicycle for 1 hour and travels 16 km (about 10 mi). Find the angular velocity of the wheel if the radius is 30 cm.
54. Find the number of rpm for the wheel in Problem 53.