Problems

6.1 Angle of Rotation and Angular Velocity 16.

What is the angle of rotation (in degrees) between two hands of a clock, if the radius of the clock is $0.70\,\text{m}$ and the arc length separating the two hands is $1.0\,\text{m}$?

    a. 40°
    b. 80°
    c. 81°
    d. 163°

17.

A clock has radius of $0.5\,\text{m}$. The outermost point on its minute hand travels along the edge. What is its tangential speed?

    a. $9\times10^{-4}\,\text{m/s}$
    b. $3.4\times10^{-3}\,\text{m/s}$
    c. $8.5\times10^{-4}\,\text{m/s}$
    d. $1.3\times10^1\,\text{m/s}$

6.2 Uniform Circular Motion 18.

What is the centripetal force exerted on a 1,600 kg car that rounds a 100 m radius curve at 12 m/s?

    a. 192 N
    b. 1, 111 N
    c. 2, 300 N
    d. 13, 333 N

19.

Find the frictional force between the tires and the road that allows a 1,000 kg car traveling at 30 m/s to round a 20 m radius curve.

    a. 22 N
    b. 667 N
    c. 1, 500 N
    d. 45, 000 N

6.3 Rotational Motion 20.

An object's angular acceleration is 36 rad/s^2. If it were initially spinning with a velocity of 6.0 m/s, what would its angular velocity be after 5.0 s?

    a. 186 rad/s
    b. 190 rad/s^2
    c. -174 rad/s
    d. -174 rad/s^2

21.

When a fan is switched on, it undergoes an angular acceleration of 150 rad/s^2. How long will it take to achieve its maximum angular velocity of 50 rad/s?

    a. -0.3 s
    b. 0.3 s
    c. 3.0 s