Name / ID

Homework - Chapter 10 - Phys 105

Chapter 10

Q1. An airplane propeller is rotating at 1900 revolutions per minute (rev/min).
(a) compute the propeller's angular velocity in rad/s
(b) how many seconds does it take for propeller to turn through 35°?

Q2. A turbine blade rotates with angular velocity $\omega(t) = 2.00\frac{rad}{s} - 2.10\frac{rad}{s^3}\ t^2$.
What is the angular acceleration of the blade at t = 9.10 s?

Q3. A child is pushing a merry-go-round. The angle through which the merry-go-round has turned varies with time according to

$$\theta(t) = \left(0.400\frac{rad}{s}\right)t + (0.0120\ rad/s^3)t^3$$

(a) Calculate the angular velocity of the merry go-round as a function of time using derivative.
(b) What is the initial value of the angular velocity?
(c) Calculate the instantaneous value of the angular velocity ω_z at t = 5.00 s and
(d) Calculate the average angular velocity ω_{av-z} for the time interval t = 0 to t = 5.00 s.

Q4. A floppy disk in a computer, with a diameter of 8.89 cm, rotates with a period of 0.200 s.
(a) What is the angular speed of the disk
(b) What is the linear speed of a point on the rim of the disk?