

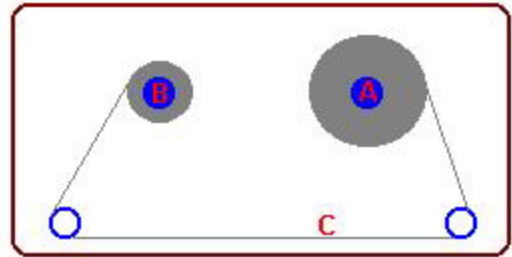
DAY 11

Homework Assignment (see syllabus for homework collection information)

1. Calculate how many degrees are in one radian.
2. Calculate what 1 RPM is in Rev/sec, Degrees/min, Degrees/sec, "Rad"/min, & "Rad"/sec.
3. An airplane propeller measures 6 ft in diameter. How fast can it spin (in RPM) without the tip of the prop exceeding the speed of sound? The speed of sound is 340 m/s.
4. A washing machine goes into the "spin cycle". From rest the washer starts rotating, gaining 1 rev/sec of rotational velocity each second. How long before it is spinning at 300 RPM? What is its angular acceleration? How many revolutions does it go through in getting up to 300 RPM?

When the spin cycle ends the washer comes to rest from 300 RPM in 4 seconds. What is its angular acceleration? How many revolutions does it go through?

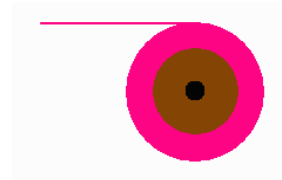
5. Refer to the figure at right. In a cassette tape (or video tape) you have a take-up spindle (A), a feeder spindle (B), and the tape (C).



When the tape is being played, the tape is fed through the player so that C moves at constant linear velocity. When the tape is being fast-forwarded, A rotates with constant angular velocity.

In both cases discuss how A, B, and C move as the tape runs from being fully wound around B to fully wound around A.

6. Pink thread is wound around a large wooden spool as shown. The empty wooden spool has a diameter of 1.5 inches. When the spool is full it has a diameter of 2.25 inches.



The spool sits atop a sewing machine, which takes up the thread at the rate of 6 inches every 10 seconds. Find the angular velocity of the spool in RPM when the spool is full and when the spool is nearly empty.