Announcements

1. HW7 due March 18.
2. Pick up exam 1 in NPB 1100 or before/after lecture.
2. Solutions to even number questions in textbook

   starting Chapter 6, numerical values will be posted in the HW solutions page.
3. Prof. Reitze's office hour for Friday March 6 changed to 3:30 to 4:30 pm
4. Week of March 17 and 19 (after spring break)

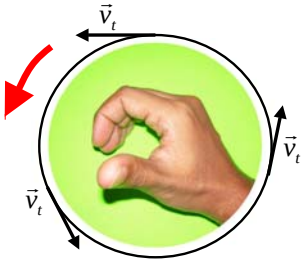
   Prof. Yelton will give lectures

   Profs. Chan and Reitze will not hold offices hours in this week

Angular velocity is a vector

magnitude $V_t = R\omega$ $\omega = \frac{V_t}{R}$

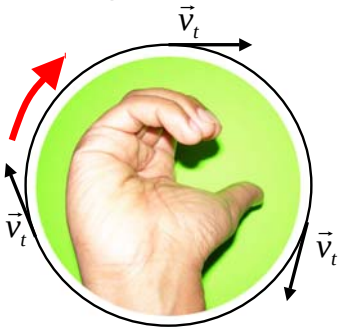
Direction of Tangential Velocity v_t and angular frequency ω



Right Hand Rule

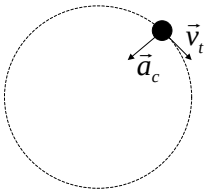
$\vec{\omega}_t$ out of screen

And the other way...



$\vec{\omega}_t$ **Into Screen**

Centripetal Acceleration



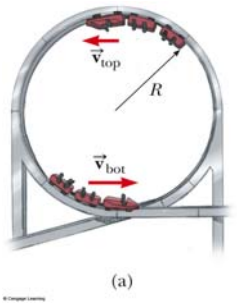
– The magnitude of the centripetal acceleration is given by $a_c = \frac{V_t^2}{R} = R\omega^2$

– This direction is toward the center of the circle

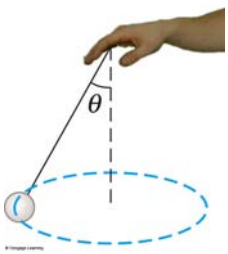
Vertical Circle

- Look at the forces at the top of the circle
- The minimum speed at the top of the circle for the cars to remain in contact with the track is

$$v_{top} = \sqrt{gR}$$



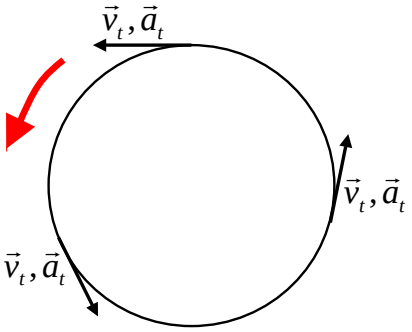
Homework problem in webassign



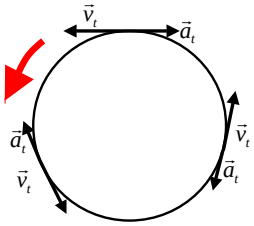
Tangential acceleration in circular motion

Direction of v_t and a_t are the same

If rotation is speeding up



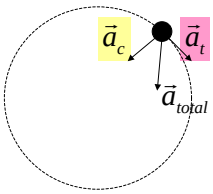
Direction of v_t and a_t are opposite if rotation is slowing down



Total Acceleration

- The tangential component of the acceleration $\vec{a}_t$ is due to changing speed
- The centripetal component of the acceleration $\vec{a}_c$ is due to changing direction
- Total acceleration can be found from these components

$$a = \sqrt{a_t^2 + a_C^2}$$



Have a nice spring break!