5.26.20

2D Motion: Circles

Today's Objectives:

- How is turning different than driving in a straight line?
- Net force and acceleration of a circle
- Circular Motion Equations and using them to solve problems

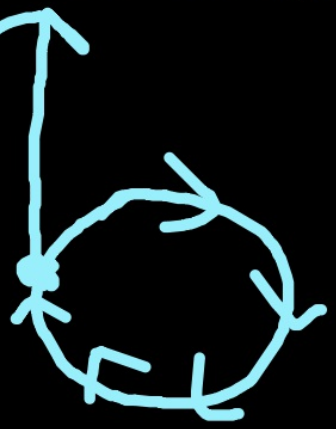
2D Motion: Circles

1. Objects moving in a circle require a Net force acting toward the Center

No exceptions!

2. If you remove the net force, (or if you drive too fast around a corner) the car will go in a straight line called

Tangent.



- **Types of Forces that keep objects in the circle**

(also known as Net Centripetal Force) ΣF_c

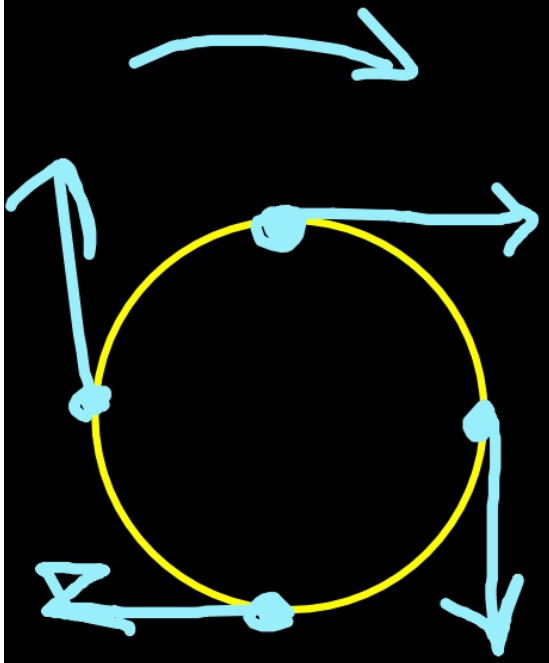
∴ "center-seeking"

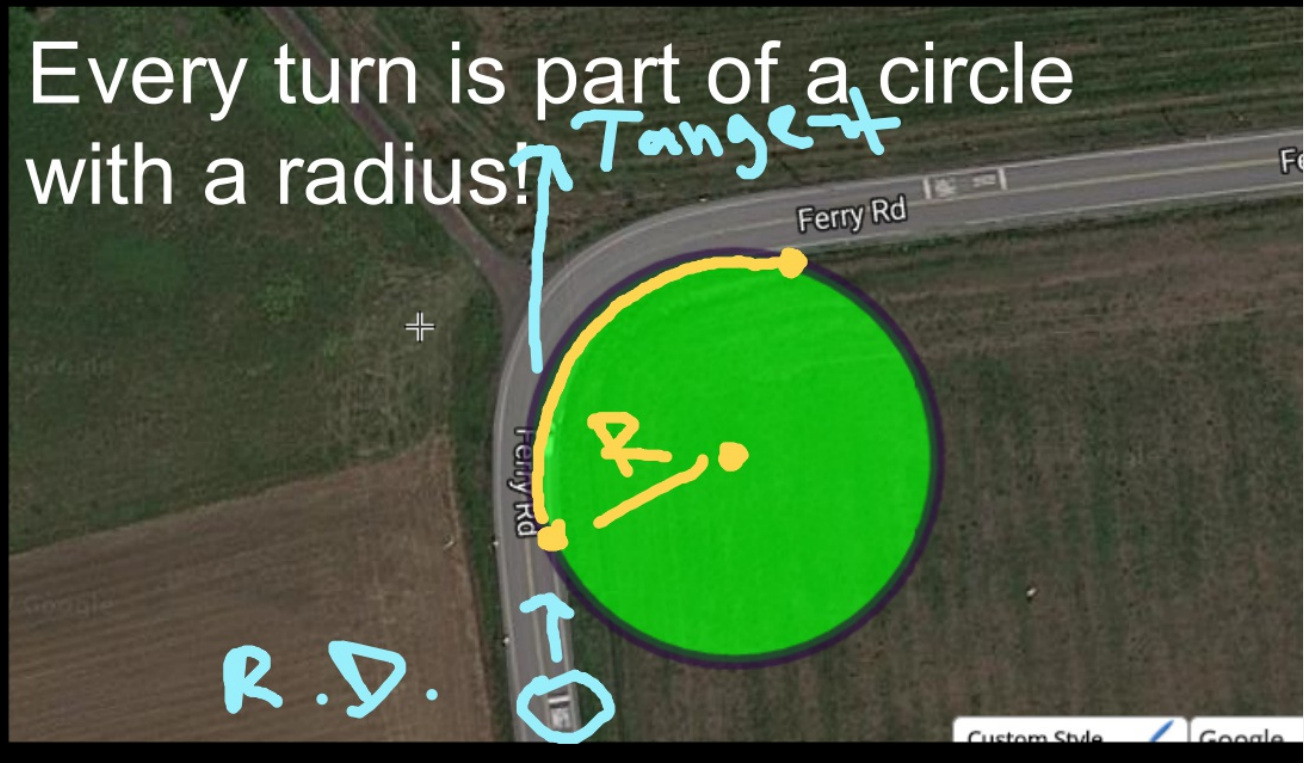
1. Friction (driving / running)
2. Tension (lasso / tether ball)
3. Gravity (Keeps objects in orbit)

When an object is moving in a circle...

the object is always changing Direction

which means that it is constantly Accelerating.





Circular Equations

$$V = \frac{2\pi R}{T}$$

$$\Sigma F_c = \frac{m v^2}{R}$$

V: Speed (m/s)

π: 3.14

R: Radius (m)

T: Period (s)
(Time)

ΣF_c: Net Centripetal Force (N)

m: mass (kg)