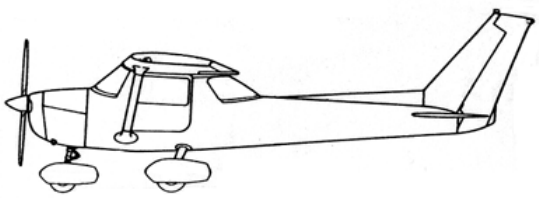
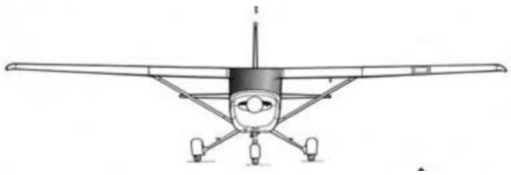
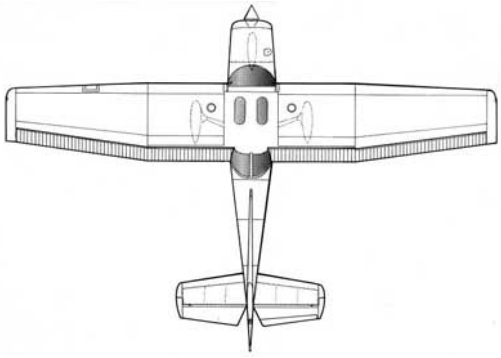
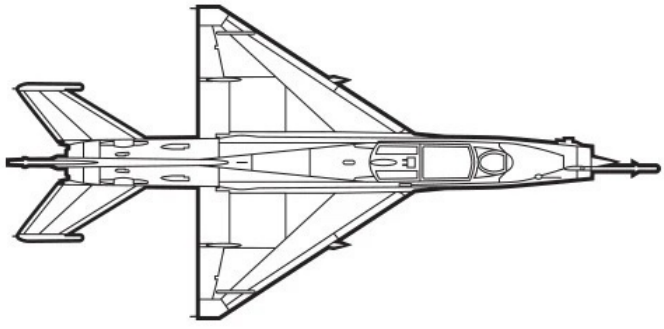


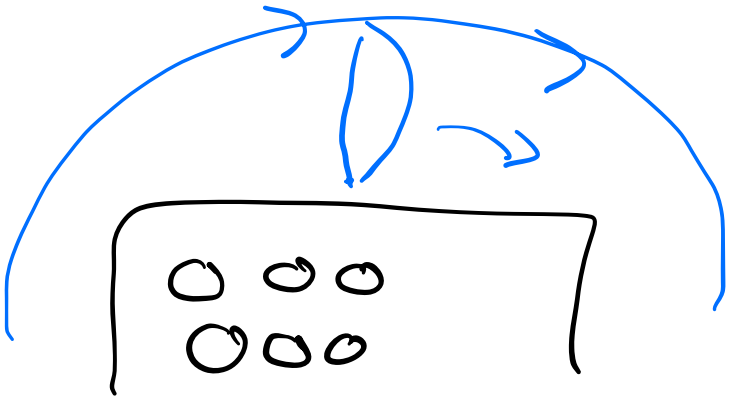






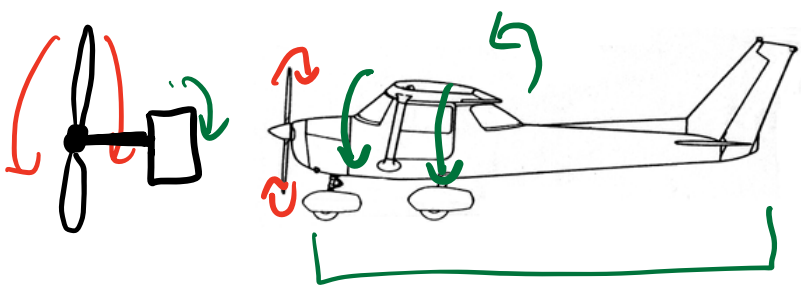
Turning Tendencies

Clockwise turning propeller

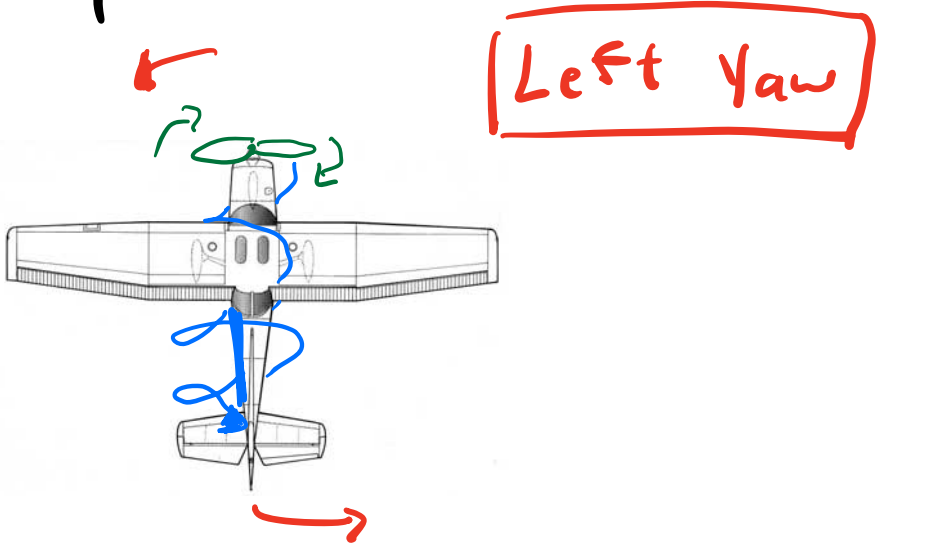


① Torque

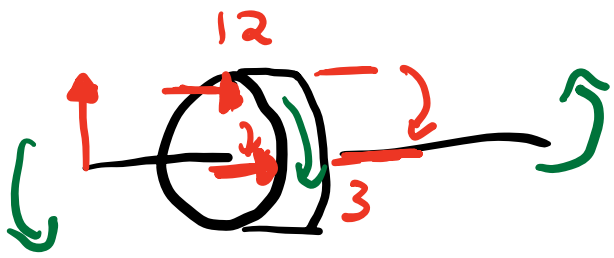
Newton's 3rd law



② Propeller Slipstream



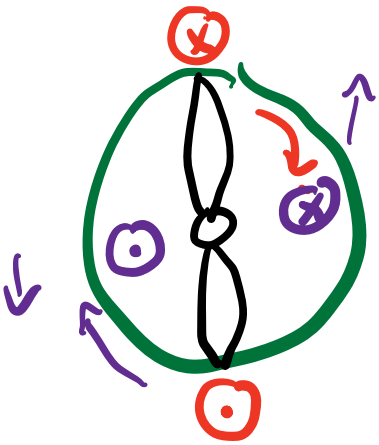
③ Gyroscopic Precession

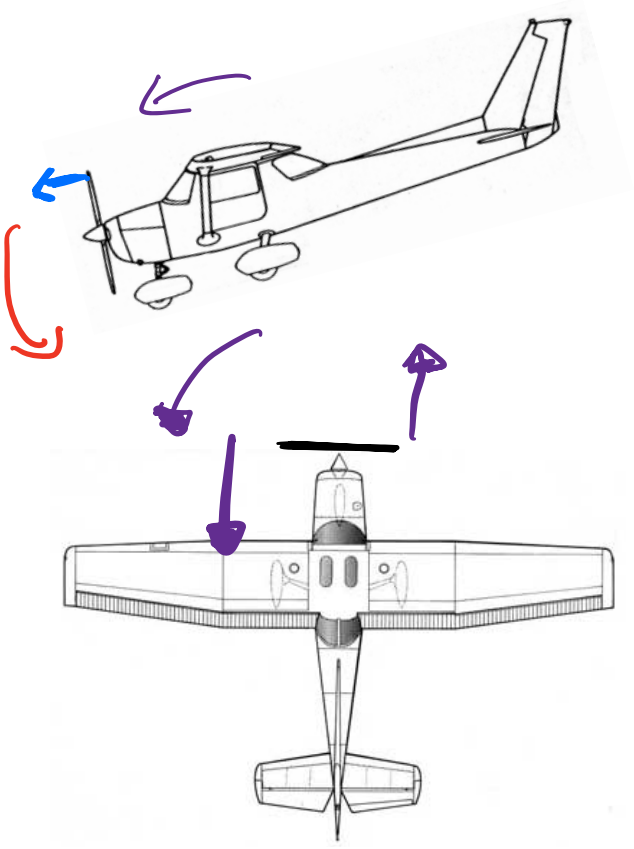


Spinning Object

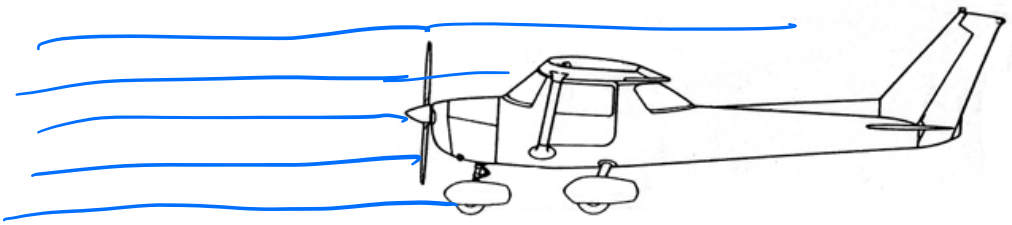
① Rigidity in Space

② Prescssion



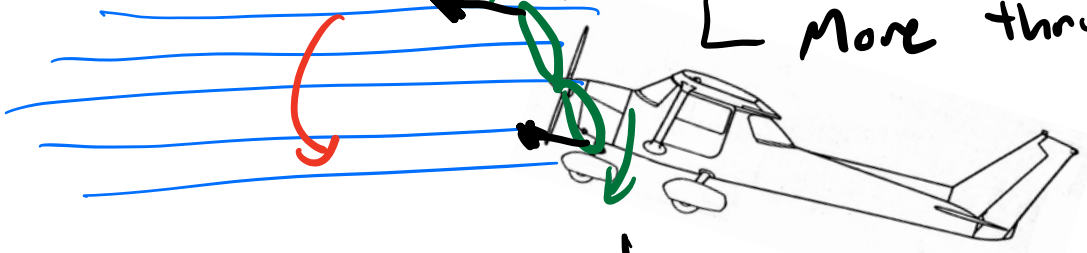


④ P-Factor



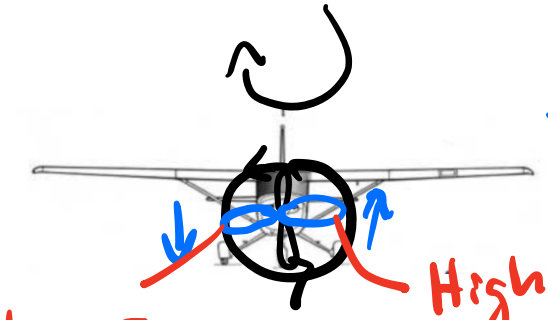
Yaw Left

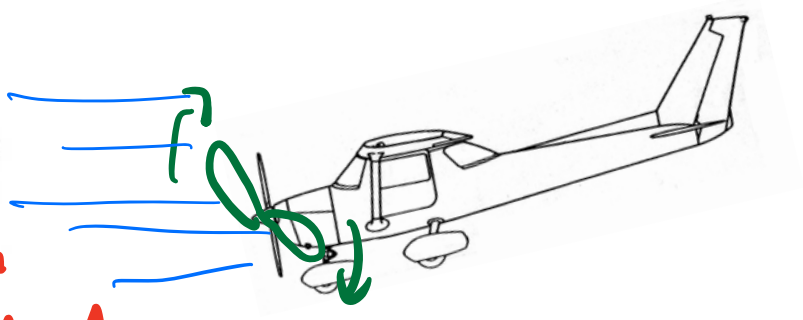
Higher AoA
└ More thrust



└ Lower AoA
└ Less thrust

Yaw Right



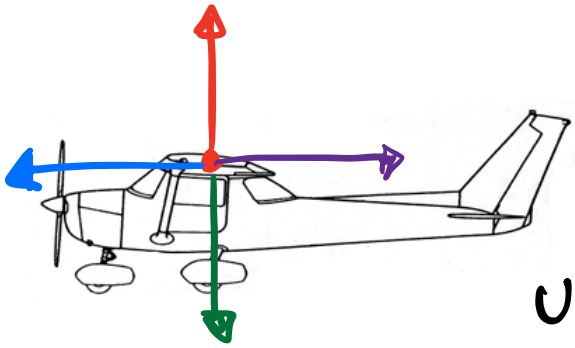


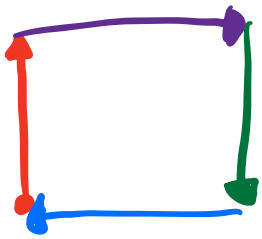
Lower AoA

High AoA

Forces in Flight

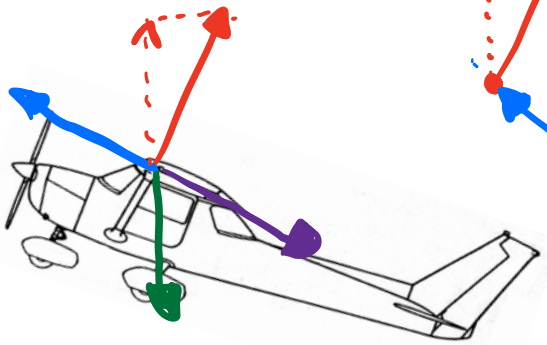
S & L:

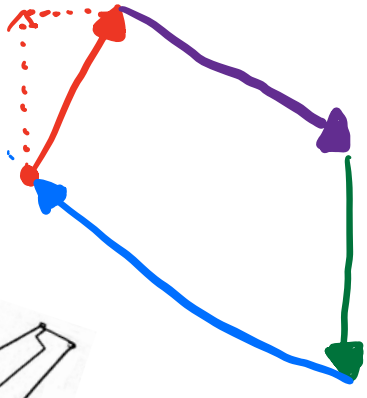




Unaccelerated Flight

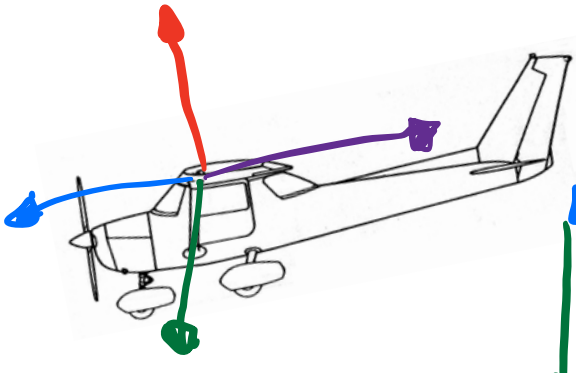
Climb:

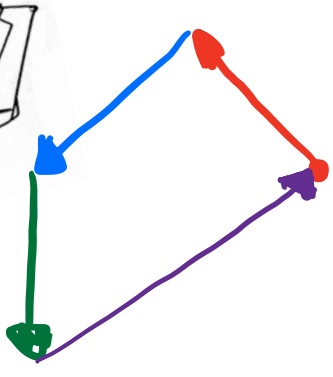




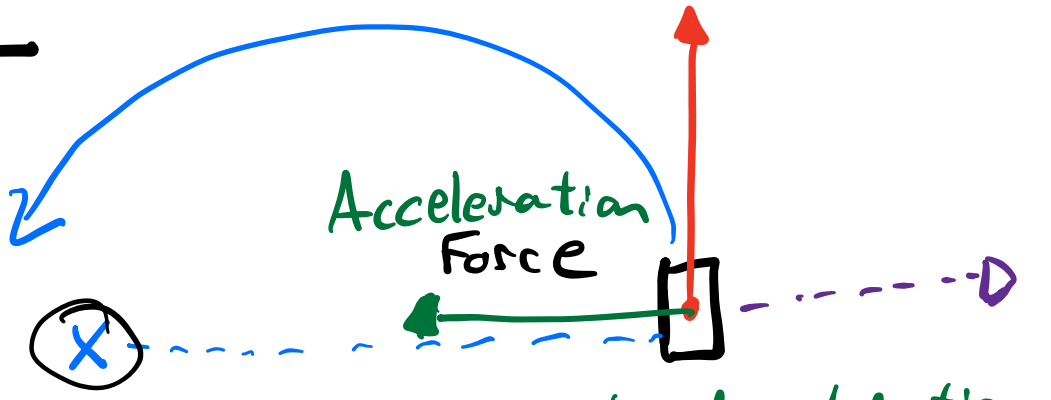
More thrust

Descent



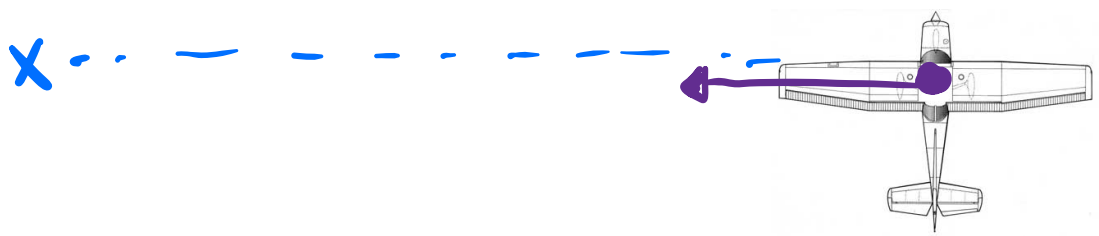


Turns

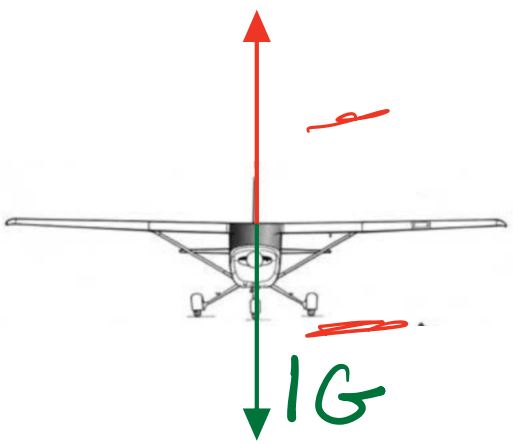


Centripetal Acceleration

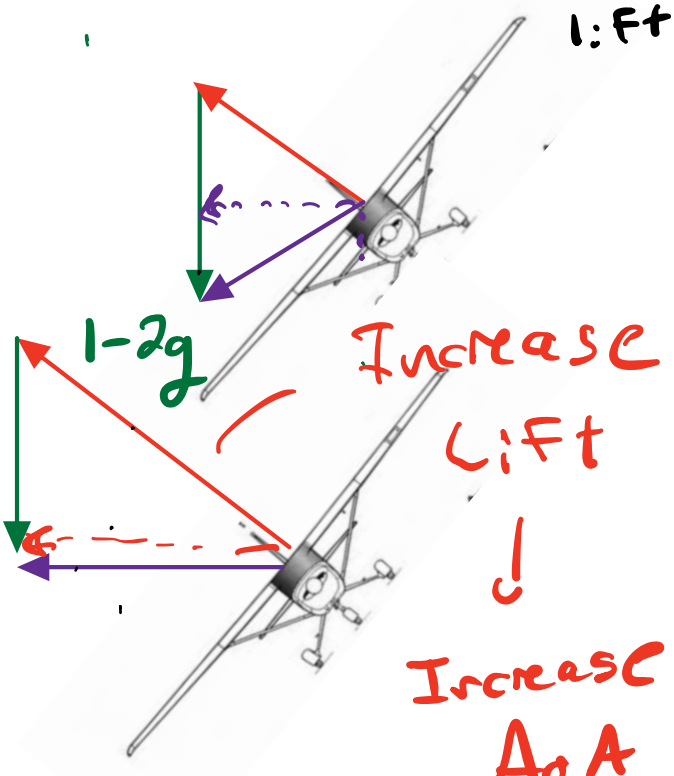
Force ∴ Acceleration

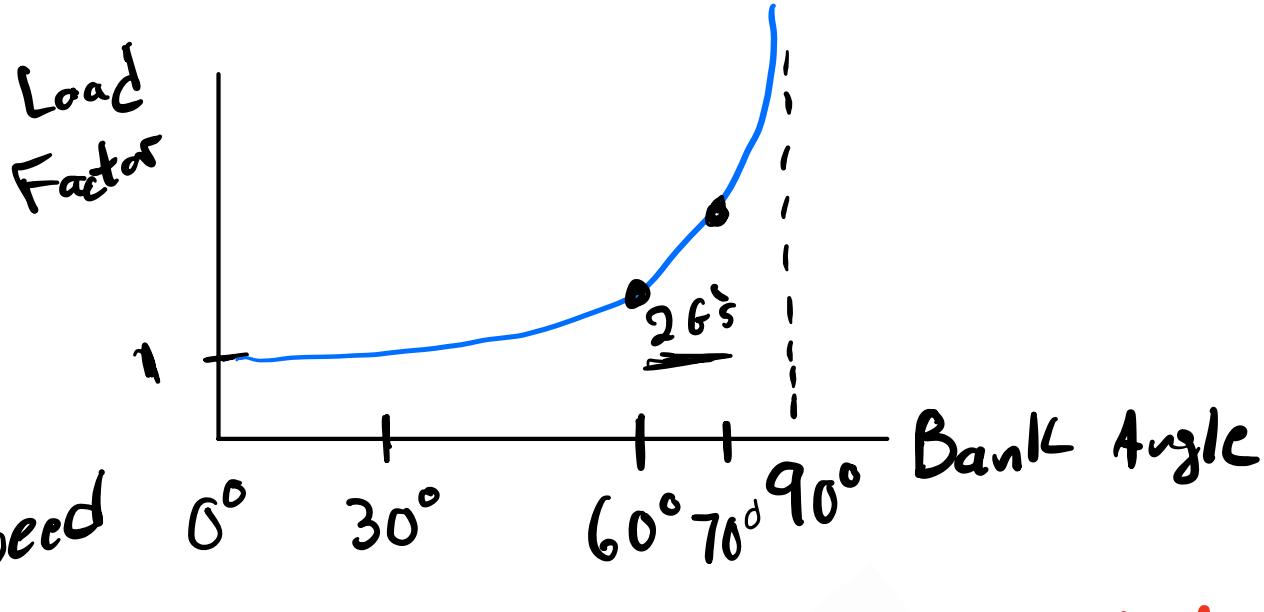


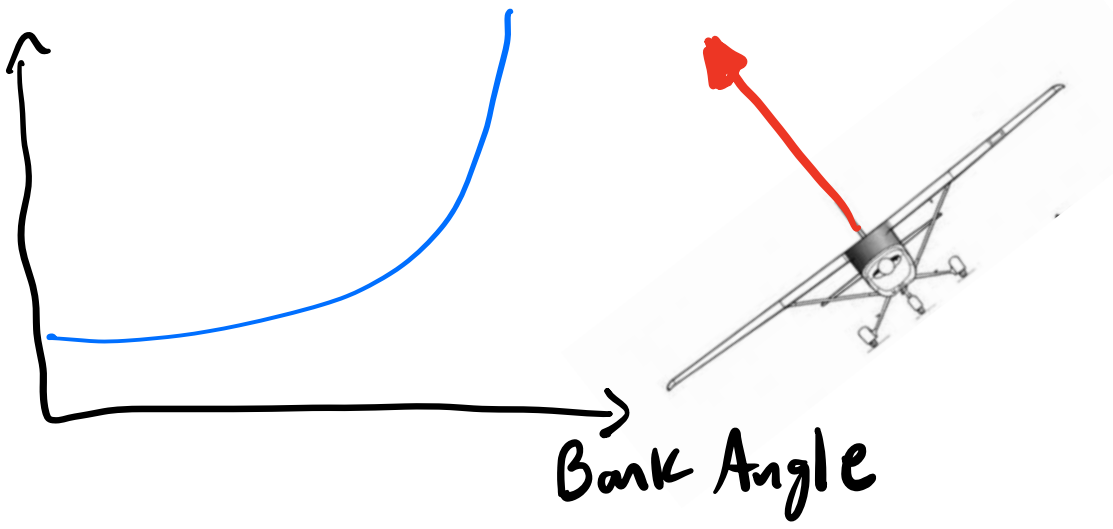
S ¾L



Turn, no extra



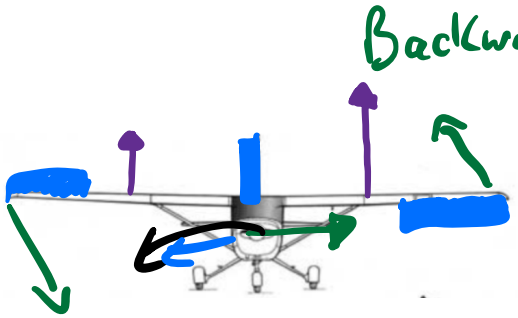




More AoA
Same Airspeed

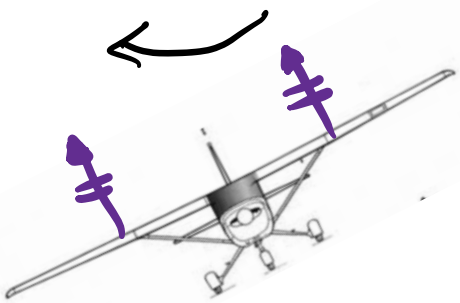
Adverse Yaw

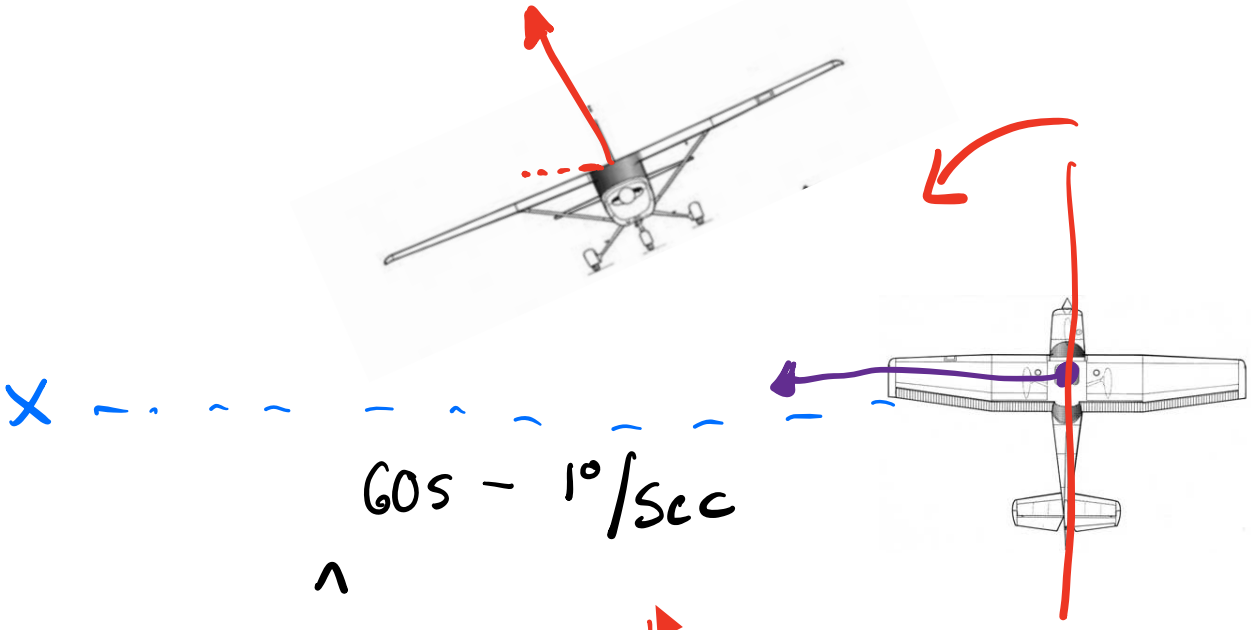
Less lift
~
— Less induced drag



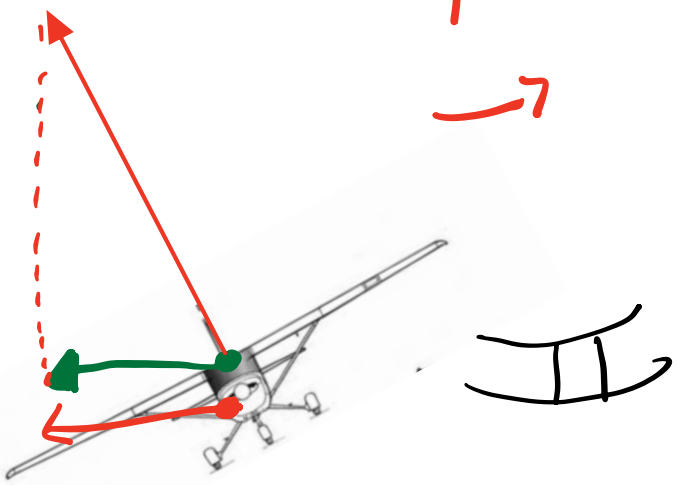
More lift
~
— more induced drag

Rudder — roll rate



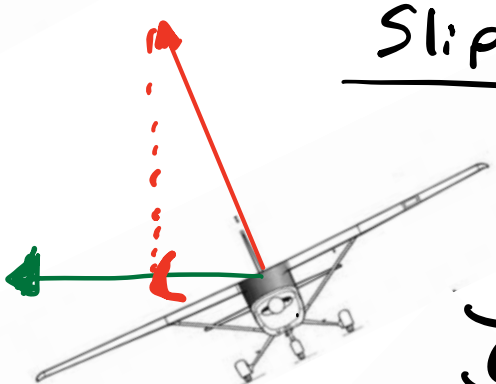


60s - 1°/sec



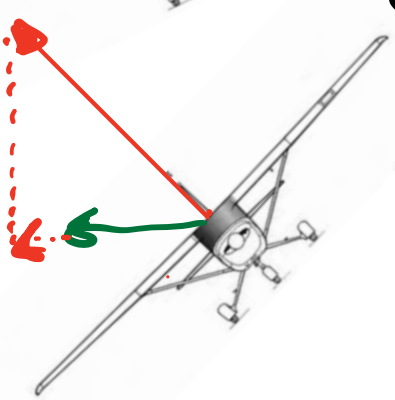
Nose rotating too quickly

Slip



Nose rotating too slowly

Skid



Left turning tendencies "help"
rudder left turns.

"Hurt" on right turns.