Rules of Thumb

TAKE OFF

- T/O distance increases 15% for each 1000' Density Altitude (DA) above sea level
- Available engine HP decreases 3% for each 1000' DA above sea level
- Fixed pitch, non-turbo a/c climb performance decreases 8% for each 1000' DA above sea level
- Variable pitch, non-turbo a/c climb performance decreases 7% for each 1000' DA above sea level
- Vr = ~1.15 X Vs

CLIMB

- Vy decreases ~1/2 to 1 knot for each 1000' DA
- Vy, Vx, and Vg (best glide) decreases ~1/2 knot for each 100# under MGW
- Va decreases 1% for each 2% reduction in gross weight

CRUISE

- TAS increases 2% over IAS for each 1000' above sea level
- Cruise fuel consumption of a non-turbo-charged a/c engine = 1/2 the rated HP/10

APPROACH

- Final approach speed = 1.3 X Vso. This is also known as Vref
- A 1° reduction in approach angle will increase landing distance 13%
- For each 1000' increase in field elevation above sea level, stopping distance increases 4%
- 10° – 25° of flaps add more lift than drag; 25° – 40° flaps add more drag than lift
- A tailwind of 10% of your final approach speed increases your landing distance by 20%; A headwind of 10% decreases landing distance by 20%
- For each knot above POH Vref (final approach speed) over the runway end numbers, the touchdown point will be 100' further down the runway
- A 10% change above POH recommended final approach airspeed will cause a 20% increase in stopping distance
- A slippery or wet runway may increase your landing distance by 50% or more.