



DENSITY ALTITUDE

QUICK REFERENCE

THE TWO-STEP CALCULATION

$$PA = \text{field elevation} + (29.92 - \text{altimeter}) \times 1000$$

$$DA = PA + 118.8 \times (\text{OAT} - \text{ISA temp at PA})$$

ISA standard: 15°C (59°F) at sea level, cooling ~2°C per 1,000 ft. **Rule of thumb:** density altitude rises about **120 ft for every 1°C** above the standard temperature.

PERFORMANCE LOSS

RULES OF THUMB

DA ABOVE FIELD	POWER	T/O ROLL	CLIMB
+1,000 ft	97%	+10%	-7%
+2,000 ft	94%	+20%	-14%
+4,000 ft	88%	+40%	-28%
+6,000 ft	82%	+60%	-42%
+8,000 ft	76%	+80%	-56%

Normally-aspirated piston near gross weight. Planning approximations — always verify against your POH.

MORE RULES OF THUMB

- **True airspeed:** TAS $\approx$ IAS + 2% per 1,000 ft of DA (your groundspeed runs faster than indicated).
- **Humidity:** at 95°F & 100% RH near sea level, humid air adds roughly **700-800 ft** to DA beyond the dry-air figure.
- **Turbocharged / turbine:** flat-rated to a threshold altitude — above it, available power falls off too.

WORKED EXAMPLE — TRUCKEE, CA (KTRK)

5,904 ft · 30.12 inHg · 30°C → PA **5,704 ft**, DA $\approx$ **8,828 ft**

The aircraft takes off, climbs, and (if normally aspirated) makes power as if it were at nearly 8,800 ft.