

ATP Quick Reference: Formulae

Formulae used in Performance Calculations

Calculating Va: (maneuvering speed)

*Sqrt of (TOW / MGTOW) * published Va (162mph)*

Example:

Actual weight: 24000 lbs.

MGTOW: 28,000 lbs

Sqrt of 24000/28000 = 0.926 * 193 (published Va) = 178.68

Calculating lead intercepts for DME arcs and any selected course

TAS / 200

Example:

200KTAS / 200 = 1.0

Therefore, initiate a standard rate turn 1.0nm prior to arriving at the arc.

For a 45 degree intercept to the final approach course, 0.5nm
(use FMS/GPS for XTRK information.)

For a 30 degree intercept, initiate at 0.2nm.

Calculating Rate of Descent to track glideslope

*(Groundspeed / 60) * 300*

Example:

135 knots GS

135/60 = 2.25

2.25 * 300 = 675FPM

Note: 300 is used because flying a 3-degree glideslope will cause the aircraft to descend 300 feet per nautical mile (FPNM.) If a nonstandard glideslope angle is published on the IAP, use that number instead (i.e. if 3.24 degrees, use 324.)

Alternate method (rule of thumb):

Use 10% of groundspeed, and multiply times 5.

Example:

140 knots GS

140 * 5 = 700FPM

This method is quite accurate, provided a standard 3.00 degree glideslope.

Initiating level-off from climb or descent

10% of Rate of Climb/Descent

Example:

If climbing at 500FPM, initiate level-off 50 feet below target altitude.

Calculating bank angles for standard rate turns

10% of TAS / ½ of that number

Example:

120KTAS

12 + 6 = 18 degrees angle of bank

Calculating roll-out from steep (45 degree bank angle) turns

Initiate roll-out at a heading equivalent to ½ the bank angle.

Example:

45 degree bank

Turn initiated at 360 degrees to the left

Initiate rollout at (45 / 2) 22.5 degrees prior to reaching 360, i.e. 023 degrees.

Calculating VDP (or PDP, Planned Descent Point)

Distance-based VDP/PDP:

MDA (HAT) / 300

Example:

MDA is 430 ft. AGL. $430/300 = 1.4\text{nm}$

Time-based VDP/PDP:

Subtract 10% of the MDA (HAT) from the time between FAF and MAP

Example:

MDA is 430 ft. AGL

Time between FAF and MAP is 3:54

10% of 430 = 43

Subtract 43 seconds from 3:54 = 3:11 to VDP/PDP