



COMPLIMENTS OF CLIFF IZER

Rate-of-descent formula

A useful formula pilots use to calculate descent rates (standard 3° glide slope):

$$\text{Rate of descent} = \text{ground speed} / 2 \times 10$$

or

$$\text{Rate of descent} = \text{ground speed} \times 5$$

For other glideslope angles:

$$\text{Rate of descent} = \text{glide slope angle} \times \text{ground speed} \times 100 / 60$$

The latter replaces $\tan \alpha$ (see below) with $\alpha/60$, which is about 95% accurate up to 10°.

Example:

$$\begin{aligned} &120 \text{ kts} \times 5 \\ \text{or} \\ &120 \text{ kts} / 2 \times 10 \\ &= 600 \text{ fpm} \end{aligned}$$

The above simplified formulas are based on a [trigonometric](#) calculation:

$$\text{Rate of descent} = \text{ground speed} \times 101.25 \times \tan \alpha$$

where:

- α is the descent or glideslope angle from the horizontal (3° being the standard)
- 101.25 ($\frac{\text{fpm}}{\text{kt}}$) is the conversion factor from [knots](#) to feet per minute (1 knot \equiv 1 $\frac{\text{nm}}{\text{h}}$ = 6075 $\frac{\text{ft}}{\text{h}}$ = 101.25 fpm)

Example:

$$\begin{aligned} \text{Ground speed} &= 250 \text{ kts} \\ \alpha &= 4.5 \\ 250 \text{ kts} \times 101.25 \frac{\text{fpm}}{\text{kt}} \times \tan 4.5 \\ &= 1992 \text{ fpm} \end{aligned}$$