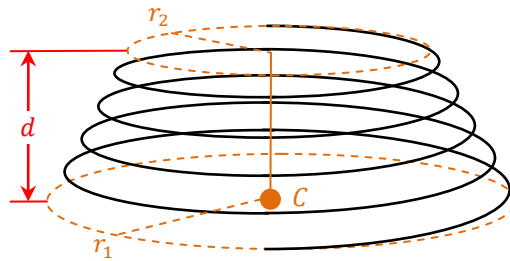


## Parametric 3D Spiral

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A simple 3D spiral is created by expanding or contracting the horizontal radius of a spiral linearly and increasing or decreasing the height linearly. The basic form of this equation assumes a starting point  $C$  that marks the center of the first spiral radius,  $r_1$ . The spiral extends vertically by a distance  $d$  and terminates with a radius  $r_2$ .



The parametric equations have the form shown below, where  $t$  is the independent parameter introduced and  $N$  is the full number of turns to complete from a  $t$ -value between 0 and 1.

$$\begin{aligned}x &= x_C + (r_1 \cdot (1 - t) + r_2 \cdot t) \cdot \cos(2\pi N \cdot t) \\y &= y_C + (r_1 \cdot (1 - t) + r_2 \cdot t) \cdot \sin(2\pi N \cdot t) \\z &= z_C + d \cdot t\end{aligned}$$

An example set of points is shown for these equations below. The points are evenly sampled in the parameter domain which gives them a uniform angular separation.

