



Known baseangle, tiltangle

$x_1, y_1$

basewidth, length, endwidth

$$x_4 = x_1 + \text{basewidth} \times \sin(\text{baseangle})$$

$$y_4 = y_1 + \text{basewidth} \times \cos(\text{baseangle})$$

$$x_m = \frac{1}{2}(x_1 + x_4)$$

$$y_m = \frac{1}{2}(y_1 + y_4)$$

angle of perpendicular = baseangle -  $90^\circ$

angle of length = baseangle -  $90^\circ$  + tiltangle

(call it  $\alpha$ )

$$x_f = x_m + \text{length} \times \sin(\alpha)$$

$$y_f = y_m + \text{length} \times \cos(\alpha)$$

end angle =  $\alpha + 90^\circ$

$$x_3 = x_f + \frac{\text{endwidth}}{2} \times \sin(\text{endangle})$$

$$y_3 = y_f + \frac{\text{endwidth}}{2} \times \cos(\text{endangle})$$

$$x_4 = x_f - \frac{\text{endwidth}}{2} \times \sin(\text{endangle})$$

$$y_4 = y_f - \frac{\text{endwidth}}{2} \times \cos(\text{endangle})$$