# SIDE WIND COMPENSATION

At the target we require the *y* and z components of error to be zero. From the previous note on arrow trajectory assuming the sightline (from the eye to the centre of the target) coincides with the *x* - axis we have:

$$y = -q + \frac{v_0}{u_0}R - \frac{g}{2u_0^2}R^2\left(1 + \frac{2}{3}kR\right) = 0$$
$$z = -r + \frac{w_0}{u_0}R - \frac{h}{2u_0^2}R^2\left(1 + \frac{2}{3}kR\right) = 0$$

Where *q* is the distance of the nock below the eye at anchor and *r* is the offset of the nock sideways. Rearranging these equations we get

$$-q + \frac{v_0}{u_0}R = g\left(\frac{R^2}{2u_0^2}\left(1 + \frac{2}{3}kR\right)\right)$$
$$-r + \frac{w_0}{u_0}R = h\left(\frac{R^2}{2u_0^2}\left(1 + \frac{2}{3}kR\right)\right)$$

hence

$$-r + w_0\frac{R}{u_0} = -\frac{h}{g}q + \frac{h}{g}v_0\frac{R}{u_0}$$

This equation has an infinite number of solutions. In most of them the choice of r and $w_0$ depend on *R* but one stands out as particularly significant. By making $\frac{r}{q} = \frac{w_0}{v_0} = \frac{h}{g}$ the equation becomes an identity independent of *R*. To achieve this condition, tilt the bow by an angle whose tangent is *h*/*g* keeping the sightline fixed.