Moltiplico per la radice al den.

$$\Rightarrow \frac{\cancel{v_0^2}}{\cancel{g}}(\cos^2\alpha - \sin^2\alpha)\sqrt{\left(\frac{v_0^2}{g}\right)^2 \sin^2\alpha + \frac{2hv_0^2}{g}}$$

$$- \sin\alpha \frac{v_0^{\cancel{4}\,2}}{\cancel{g^2}} \sin^2\alpha - 2h\frac{\cancel{v_0^2}}{\cancel{g}}\sin\alpha$$

$$+ \frac{v_0^{\cancel{4}\,2}}{\cancel{g^2}} \sin\alpha \cos^2\alpha = 0$$

$$\cos^2\alpha = 1 - \sin^2\alpha \quad \Rightarrow$$

$$(1 - 2\sin^2\alpha)\sqrt{\frac{v_0^4}{g^2}\sin^2\alpha + \frac{2hv_0^2}{g}} = \frac{v_0^2}{g}\sin^3\alpha + 2h\sin\alpha$$

$$- \frac{v_0^2}{g}\sin\alpha + \frac{v_0^2}{g}\sin^3\alpha$$

$$= 2\frac{v_0^2}{g}\sin^3\alpha + 2h\sin\alpha - \frac{v_0^2}{g}\sin\alpha$$

$$= \sin\alpha\left(2h - \frac{v_0^2}{g} + 2\frac{v_0^2}{g}\sin^2\alpha\right)$$

Quadriamo i 2 termini dell'uguaglianza $\Rightarrow$

$$(1 + 4\sin^4\alpha - 4\sin^2\alpha)\left(\frac{v_0^4}{g^2}\sin^2\alpha + \frac{2hv_0^2}{g}\right)$$

$$= \sin^2\alpha\left(4h^2 + \frac{v_0^4}{g^2} + 4\frac{v_0^4}{g^2}\sin^4\alpha - 4\frac{hv_0^2}{g} + 8\frac{hv_0^2}{g}\sin^2\alpha\right.$$

$$\left. - 4\frac{v_0^4}{g^2}\sin^2\alpha\right)$$

$$\cancel{\frac{v_0^4}{g^2}\sin^2\alpha} + \frac{2hv_0^2}{g} + \cancel{4\frac{v_0^4}{g^2}\sin^6\alpha} + 8\frac{hv_0^2}{g}\sin^4\alpha - \cancel{4\frac{v_0^4}{g^2}\sin^4\alpha} - 8\frac{v_0^2h}{g}\sin^2\alpha$$

$$= 4h^2\sin^2\alpha + \cancel{\frac{v_0^4}{g^2}\sin^2\alpha} + \cancel{4\frac{v_0^4}{g^2}\sin^6\alpha} - 4\frac{hv_0^2}{g}\sin^2\alpha + 8\frac{hv_0^2}{g}\sin^4\alpha - \cancel{4\frac{v_0^4}{g^2}\sin^4\alpha}$$