A juggler throws balls into air, He throws one whenever s highest the previous one is at its highest point. How high do the balls rise if he throws n balls each sec? Acceleration due to gravity is g.

If he throws n balls each sec, therefore, the time required to reach the highest point equals:

$t = \frac{1}{n} \, sec$

Coordinate for uniformly accelerated motion equals:

$h = v_0 t - \frac{gt^2}{2}$

v_0 - initial velocity of the ball

g – gravitational acceleration

t – time

$h = v_0 t - \frac{gt^2}{2} = v_0 t - gt^2 + \frac{gt^2}{2} = (v_0 - gt)t + \frac{gt^2}{2}$

If $t = \frac{1}{n} \, s \; v_0 - gt = v = 0$ - maximum height

$h = \frac{gt^2}{2} = \frac{g}{2n^2}$

Answer: $h = \frac{g}{2n^2}$