

A pumpkin is launched with a catapult. It reaches a maximum height of 25 m. The horizontal component of its velocity is 20 m/s.

a) What is the hang time?

b) What are the horizontal and vertical components of the velocity at the end of the flight?

c) What are the horizontal and vertical components of the velocity at the beginning of the flight?

d) What is the range of the pumpkin?

$$\begin{array}{l} \underline{X} \\ V = 20 \frac{m}{s} \\ t = \underline{\underline{4.6s}} \end{array}$$

$$\begin{array}{l} d = vt \\ d = (20)(4.6) \\ d = \underline{\underline{92m}} \end{array}$$

Y ON THE WAY
DOWN

$$\begin{array}{l} V_i = 0 \frac{m}{s} \\ a = 9.8 \frac{m}{s^2} \\ d = 25m \end{array}$$

$$\begin{array}{l} \underline{d = 4.9t^2} \\ 25 = 4.9t^2 \\ \sqrt{\frac{25}{4.9}} = t = \underline{\underline{2.3s}} \end{array}$$

$$\begin{array}{l} V_f = V_i + at \\ V_f = 0 + (9.8)(2.3) \\ V_f = \underline{\underline{22.5 \frac{m}{s}}} \end{array}$$

a) HANG TIME = $2.3 \times 2 = 4.6 \text{ sec}$

b) HORIZ = $20 \frac{m}{s}$ VERT = $22.5 \frac{m}{s}$

c) HORIZ = $20 \frac{m}{s}$ VERT = $22.5 \frac{m}{s}$

d) RANGE = 92 m