Answer on Question #70189, Physics / Mechanics | Relativity |

It is possible to shoot an arrow at a speed as high as 118 m/s. If friction is neglected, how high would an arrow launched at this speed rise if shot straight up?

Solution

v_0 = 118 m/s

$h - ?$

The kinetic energy of the arrow at initial position is equal to potential energy in the top.

$$\frac{mv_0^2}{2} = mgh, \qquad h = \frac{v_0^2}{2g},$$

h = 118²/(2·9.81) = 13924/19.62 = 710 m.

Answer: 710 m