

I-52

A pole-vaulter lands on a cushion after a vault. Determine her acceleration as she sinks into the cushion (a_{cushion}) as a function of her velocity when she hits the cushion (v_i) and the distance she sinks into the cushion (d).

Motion Diagram



Motion Information

Event 1:

Event 2:

$t_i =$

$t_f =$

$r_i =$

$r_f =$

$v_i =$

$v_f =$

$a_{1,2} =$

Mathematical Analysis

Questions

If $v_i = 0$ m/s, what should a_{cushion} equal? Does your function agree with this observation?

If $d = 0$ m, what should a_{cushion} equal? Does your function agree with this observation?

What would result in a larger magnitude acceleration, hitting the cushion twice as fast or sinking one-half as far into the cushion?