Physics 101 – Fall '24

Sect.04_V1

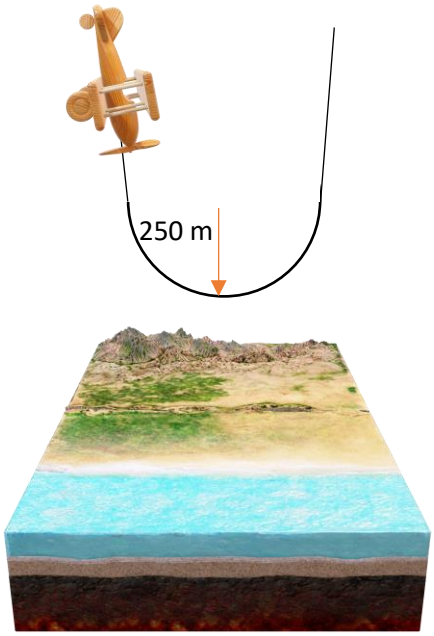
QUIZ 3

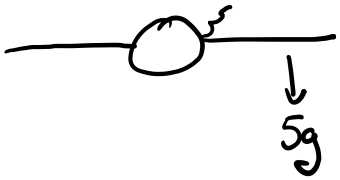
Name:	
ID:	
Total Score (out of 10 pts):	

-4/10 points for attending-

Question 1 (6/10 points)

A pilot makes a nosedive recovery with a radius of 250 meters as shown below. The plane has a structural stability up to 5 g of acceleration. What should be the maximum speed of the plane during the recovery so that the plane can remain structurally intact? (You may assume g as 10 m/s^2, there is gravity of the earth.)





The plane breaks at 5g, which means, additional 4g is required on top of the force applied by the gravity.

$$m\frac{v^2}{r} + mg \leq 5mg$$

$$v^2 = 10000\ m^2/s^2$$

$$v = 100\ m/s$$