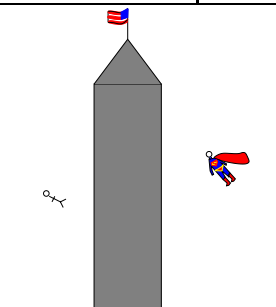


Quiz 2A	DL Sec	Grading:	
Last 6 digits of student ID:	Name:		First three letters of your family name

Superman can fly, is faster than a speeding bullet and there are no (known) limits on his strength. Obviously it would be futile to try and apply physics to *him*. However, Lois Lane is an ordinary human and thus subject to the laws of physics. This places her in quite a predicament, as the following questions refers to one of the times that she has managed to fall off one of Metropolis's skyscrapers.



1. Assume that Lois Lane is travelling at a constant speed of 60m/s as she falls. Draw a force diagram of her. Remember to label all forces and scale them correctly.
  
2. Superman catches Lois Lane as she travels at 60m/s, but he has to be careful. Lois can survive an acceleration up to 45 “g”s (450 m/s<sup>2</sup>) without killing her. What is the minimum amount of time that Superman can bring Lois to rest?
  
3. How far does she travel while Superman brings her to a stop?

$$\Delta p_{obj} = \mathbf{F}_{\text{all on obj}} \Delta t, \quad \text{KE} = \frac{1}{2} m v^2, \quad \text{PE} = mgh, \quad \mathbf{a}_{\text{ave}} = \Delta v / \Delta t, \quad \Delta d = \mathbf{v}_{\text{ave}} \Delta t;$$

$$\text{Area under } \mathbf{a}\text{-}t \text{ graph: } \Delta v, \quad \text{Area under } \mathbf{d}\text{-}t \text{ graph: } \Delta d, \quad \mathbf{F}_{\text{Earth on obj}} = m_{obj} \mathbf{g}$$

