


Can Superman leap tall buildings with a single jump?

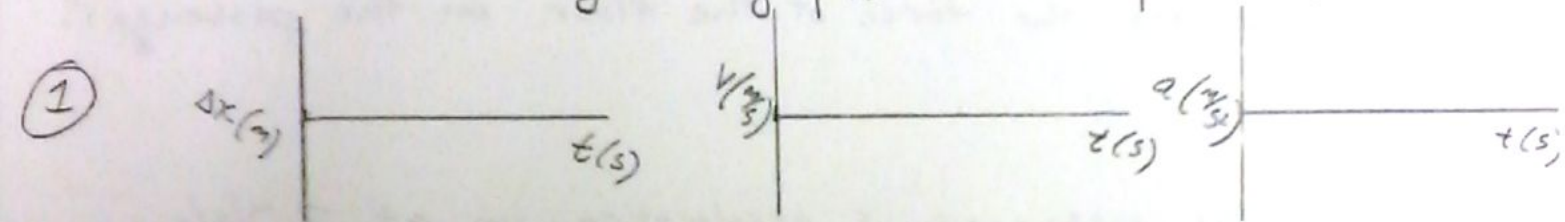
When Superman was created in the 1930's, an average skyscraper was 200 meters in height.

Assume $g = 9.8 \text{ m/s}^2$

Only consider his vertical motion.



Draw the following 3 graphs for Superman:



② Using $d = \frac{1}{2}at^2$, Find the time Superman spends in the air (assuming he "jumps" and does not "fly").

③ Using $a = \frac{\Delta v}{\Delta t}$, determine Superman's initial velocity. ($v_f = \bar{a}t + v_i$ is the same as $a = \frac{\Delta v}{\Delta t}$)

④ If Superman is in contact with ground for .5 seconds during his jump, with what force do his legs push on the ground? Superman's mass is 100 kg (USE $a = \frac{\Delta v}{\Delta t}$, $\Sigma F = m \cdot a$, and draw a force diagram)