Motion at constant acceleration

- **Acceleration:**

$$a = \frac{\text{change in velocity}}{\text{change in time}} = \frac{\Delta v}{\Delta t}$$

- **If there were no air resistance, all objects in Earth gravity would fall with the same acceleration, g=9.8 m/s^2**

- **For motion at constant acceleration *a* , with no initial speed, the distance traveled after time *t* is:**

$$d = v_{average}t = \left(\frac{at}{2}\right) \times t = \frac{at^2}{2}$$

Homework 8

Problem 1.

The largest passenger airplane, Airbus A380, has the take off speed v= 280 km/hr. It reaches that speed by moving at acceleration a=2 m/s^2, starting from rest. How long the runway should be so that it has enough space to accelerate?
Hint: few weeks ago we found the time it takes this plane to accelerate.

Problem 2.

Suppose that you are trying to reproduce an experiment of Galileo by dropping a rock from certain tower. The time of its free fall turns out to be t=5.0 seconds.
a) How tall is the tower?
b) What will be the time of the rock's fall if it is dropped from half the tower's height?