Find the acceleration for the whole system

Find the force between A and C.

What must be the magnitude of the force F so that the system is at equilibrium? (consider massless pulleys).
A rock is falling through a medium at high velocity....
Derive the velocity of the rock as a function of time, if drag force is considered are expressed as $f = av^2$ with $a > 0$ and constant.
Set $v = 0$ m/s at $t = 0$ s for simplicity.