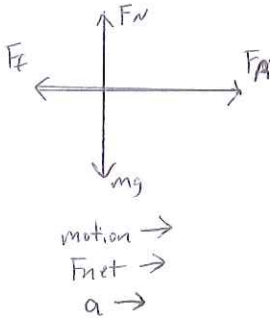
AP Physics 1 Force and Newton's 1st and 2nd Law Quiz Answers.

1. Disagree, while the object could be at rest while experiencing balanced forces, the object could also be moving with a constant velocity.
2. The object's mass would remain the same since it is made up of the same amount of matter. However, the object's weight would decreases (by a factor of 2) since the weight also depends on the acceleration of gravity.
3. No. The normal force will not equal gravity if there is another vertical force or vertical component of force. Ex: $F_N + F_{AY} - mg = 0$, where $mg = F_N + F_{AY}$

4.

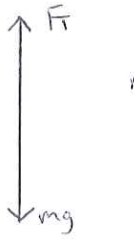


$\Sigma F_x = ma$ $\quad$ $\Sigma F_y = 0$

$F_A - F_f = ma$ $\quad$ $F_N - mg = 0$

$(F_A > F_f)$ $\quad$ $(F_N = mg)$

5.



motion ↓

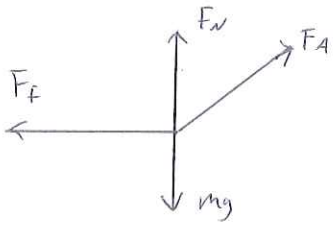
Fnet ↑

a ↑

$\Sigma F_x = 0$ $\quad$ $\Sigma F_y = ma$

$mg - F_T = ma$ $\quad$ $(F_T > mg)$

6.



motion →

Fnet = 0

$\Sigma F_x = 0$ $\quad$ $\Sigma F_y = 0$

$F_{Ax} - F_f = 0$ $\quad$ $F_{AY} + F_N - mg = 0$

$(F_{Ax} = F_f)$ $\quad$ $(F_{AY} + F_N = mg)$

7. The object will have an acceleration in the same direction as the horizontal component of the applied force. Increasing the applied force will increase the FAX resulting in unbalanced forces.

8. The net force on object 2 would have to be twice as large as the net force on object 1 in order to move with the same acceleration since object 2 has twice the mass.

9. The milk crate's inertia is the reason it continues forward. It will move in its original direction of motion (forward) until an **unbalanced** force acts on it. Ex: enough friction from the bed, or normal from hitting the front of the bed.