Whiteboarding

Newtons 2nd Law Problems:

An elevator on planet earth experiences gravity and an upward tension force. The mass of the elevator is 'm' in kg and the tension of the elevator cable is 'T' in Newtons. The elevator is initially traveling with velocity 'Vi'. Assume up is positive and down is negative. g = -10 m/s/s

a. Draw a force diagram for the elevator. Label your forces.
b. Calculate the direction and magnitude of net force. Show your work.
c. Calculate the direction and magnitude of acceleration. Show your work.
d. Calculate the elevator's velocity after 5 seconds. Show your work.
e. Present your work to the class.

1. m = 500 kg, T= 10,000 N, and Vi = -6 m/s
2. m = 400 kg, T= 4,000 N, and Vi = +5 m/s
3. m = 600 kg, T= 18,000 N, and Vi = -3 m/s
4. m = 500 kg, T= 0 N, and Vi = 0 m/s
5. m = 300 kg, T= 2,000 N, and Vi = +30 m/s
6. m = 500 kg, T= 10,000 N, and Vi = -6 m/s

A skydiver is above the surface of planet earth and experiences air resistance 'R'. Consider the skydiver and the parachute to be a single system with mass 'm'. Do not include tension forces on the skydiver. The skydiver has initial velocity 'Vi'. Assume up is positive and down is negative. g = -10 m/s/s

a. Draw a force diagram for the system. Label your forces.
b. Calculate the direction and magnitude of net force. Show your work.
c. Calculate the direction and magnitude of acceleration. Show your work.
d. Describe what is likely happening to the skydiver based on the assigned numbers. (e.g. parachute opening, jumping from the plane, etc…)
e. Present your work to the class.

7. m = 100 kg, R= 1600 N, and Vi = -1 m/s
8. m = 70 kg, R= 600 N, and Vi = -9 m/s
9. m = 50 kg, R= 500 N, and Vi = -49 m/s
10. m = 30 kg, R= 200 N, and Vi = -76 m/s
11. m = 60 kg, R= 1500 N, and Vi = -26 m/s
12. m = 75 kg, R= 0 N, and Vi = 0 m/s

An elevator on planet earth experiences gravity and an upward tension force. The mass of the elevator is 'm' in kg and the acceleration of the elevator cable is 'a' in m/s/s. The elevator is initially traveling with velocity 'Vi'. Assume up is positive and down is negative. g = -10 m/s/s

a. Draw a force diagram for the elevator. Label your forces.
b. Calculate the direction and magnitude of the tension force. Show your work.
c. Describe what is likely happening to the elevator based on the assigned numbers.
d. Present your work to the class.

13. m = 500 kg, a = -2 m/s/s, and Vi = -6 m/s
14. m = 400 kg, a = +3 m/s/s, and Vi = +5 m/s
15. m = 600 kg, a = -1 m/s/s, and Vi = -3 m/s
16. m = 500 kg, a= -10 m/s/s, and Vi = 0 m/s
17. m = 300 kg, a= 0 m/s/s, and Vi = +30 m/s
18. m = 500 kg, a= +5 m/s/s, and Vi = -6 m/s