Elevator Problems – Review

Name: _____ Date: _____

1. A 65 kg person is riding in a super elevator at a constant speed upward of 560 km/h. If the elevator is located on Earth, calculate the scale reading (normal force) on the rider. Re-calculate the scale reading if this person is in the same elevator moving downwards at a constant speed of 34 km/h. Explain your results using the law of inertia.

2. A person is in an elevator accelerating upwards at 1.5 m/s/s. The scale reading (yes, the are standing on a scale) was found to be 800 N. Calculate the mass of the rider. Explain your result using the law of inertia.

3. A rider on an elevator has a mass of 78 kg. The scale they are standing on reads 720 N. Is the elevator moving at a constant speed, accelerating upwards, or accelerating downwards? Explain. If the elevator is accelerating, calculate the acceleration of the elevator. Include a FBD.

4. You are standing on a scale in an elevator on the 20^{th} floor of a building. You press the ground floor button. Explain the trip from "stop to constant speed to stop" in terms of the reading on a scale that you are standing on. Be thorough…use the law of inertia to explain why you would feel those effects.