Elevator Problems

1. A 50 kg child is standing on a scale in an elevator that is moving upwards. Determine the reading on the scale in the following situations:
   1. The elevator travels up increasing speed at a rate of 2 m/s2
   2. The elevator travels up at a constant 3 m/s
   3. The elevator slows at a rate of 1 m/s2 while traveling up
2. An elevator starts from rest and accelerates uniformly. After 4 seconds it reaches a speed of 10 m/s. It maintains this speed for 8 s. Over the next 6 seconds it slows down uniformly and comes to rest. An 85 kg man stands on a scale in the elevator during the 18 s period.
   1. Find the acceleration during the first 4 seconds and the last 6 seconds.
   2. What does the scale read during the first 4 s?
   3. What does the scale read during the next 8 s?
   4. What does the scale read during the last 6 s?
3. A woman stands on a scale in a moving elevator. Her mass is 60 kg and the combined mass of the elevator and scale is an additional 815 kg. Starting from rest, the elevator accelerates upward. During the acceleration, the hoisting cable applies a force of 9410 N.
   1. What is the acceleration of the elevator?
   2. What does the scale read during the acceleration? Does the woman feel lighter, heavier, or the same as usual?