

Name _____ Hour _____

THE ELEVATOR LAB:

$$F = m (-9.8 + a)$$

Force felt (-) mass at rest (+)

___ points, due _____ **** Be sure to show all of your work for full points.

The equation for weight is: _____

Data: You must show all of your work here on how you convert, or you will lose points.

At rest: _130_ lbs. = _____ kg = _____ N

Part 1- On the way up: _140_ lbs. = _____ kg = _____ N

Part 2- On the way down: _80_ lbs. = _____ kg = _____ N

Part I – On the way up

1. Find the **acceleration** of our elevator here at Eastview on the way up. (When you feel heavier)(It will end up a negative number because it is acting the same way as gravity to make you heavier.)

$$F = m (-9.8 + a)$$

Force felt (-) mass at rest (+)

2. Calculate the number of **g- forces** you experience during that acceleration. Make sure your answer is reasonable. Think about it...

Part 2- On the Way Down

1. Find the **acceleration** of our elevator here at Eastview at the top. (*When you feel lighter*).

$$F = m (-9.8 + a)$$

Force felt (-) mass at rest (+)

2. Calculate the number of **g- forces** you experience during that acceleration. *Make sure your answer is reasonable. Think about it...*

Analysis:

1. What is the definition of a g-force?
2. Calculate what one g-force is for you. (Use your mass)
3. What does it mean if you experience 2 g's? _____
4. What does it mean if you experience 0.75 g's? _____
5. You get in the elevator of the IDS and find that on the way up your weight goes from 150 lbs. at rest to 174 lbs. during the acceleration. What was the acceleration of the elevator? (-1.6 m/s²)
6. How many g's did you experience in the previous problem? (1.16 g's)