ELEVATOR MAN

A VIDEO DEMONSTRATION OF APPARENT WEIGHT

Name:____ Per:_____ Date:____________ *P:CC* A-76

1. Up. Suppose you ride an elevator from the ground floor to the top floor of a building. How do you feel when
a. the elevator starts moving upward? (How do you feel *physically*, not *emotionally!*)

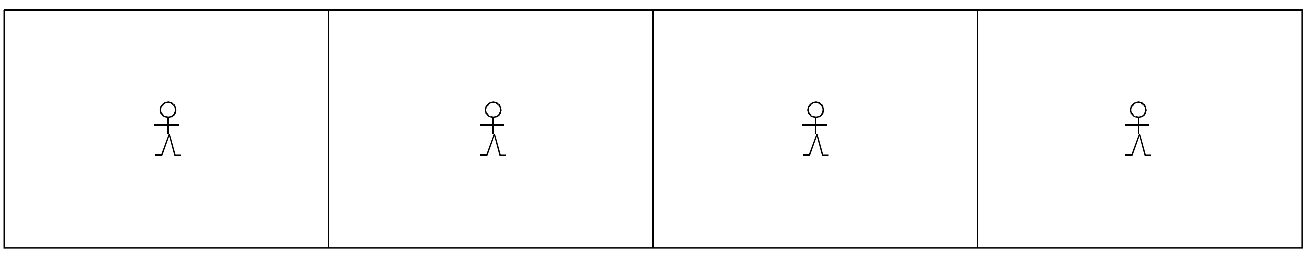
b. the elevator is about halfway to the top floor of the building?

c. the elevator slows to a stop at the top floor?

d. Which two forces act on "Elevator Man" during this ride? _Drag _Friction _Normal _Tension _Weight

e. Which of the forces acting also goes by the name "apparent weight"? (Hint: it's *not* weight.)

f. Draw force diagrams below: one when "Elevator Man" is at rest, one when "Elevator Man" is moving upward and speeding up, one when "Elevator Man" is moving upward with constant speed, one when "Elevator Man" is moving upward and slowing down.

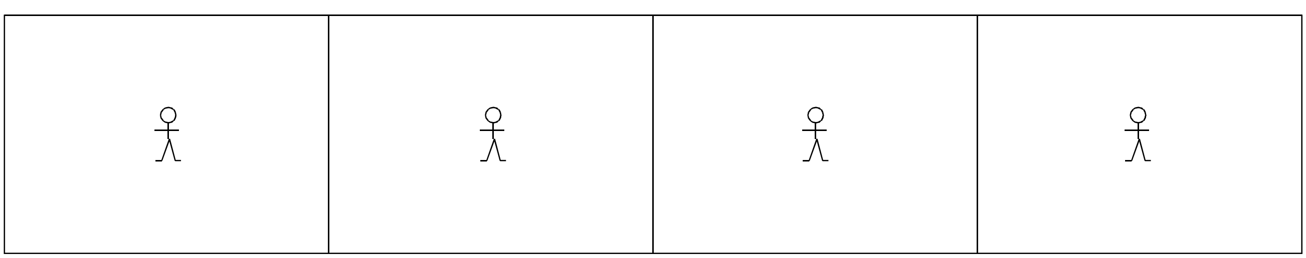


2. Down. Suppose you ride an elevator from the top floor to the ground floor of a building. How do you feel when
a. the elevator starts moving downward?

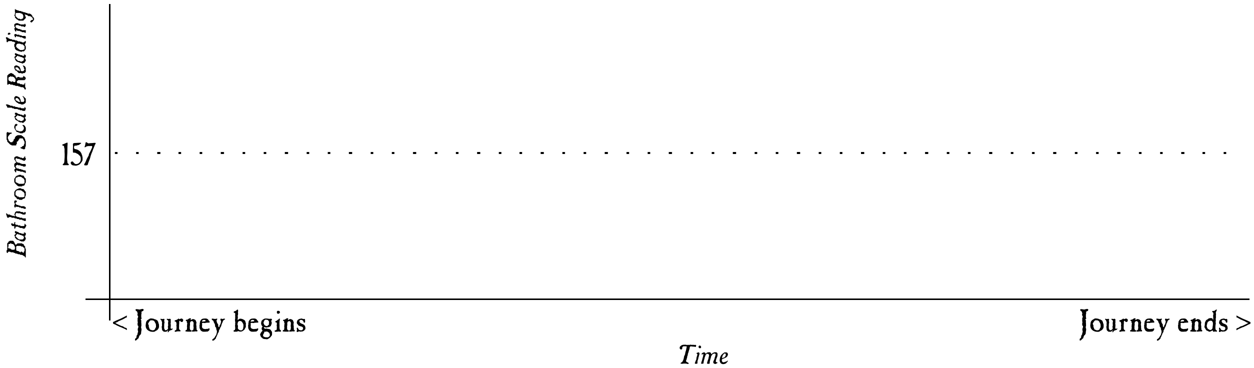
b. the elevator is about halfway to the ground floor of the building?

c. the elevator slows to a stop at the bottom floor?

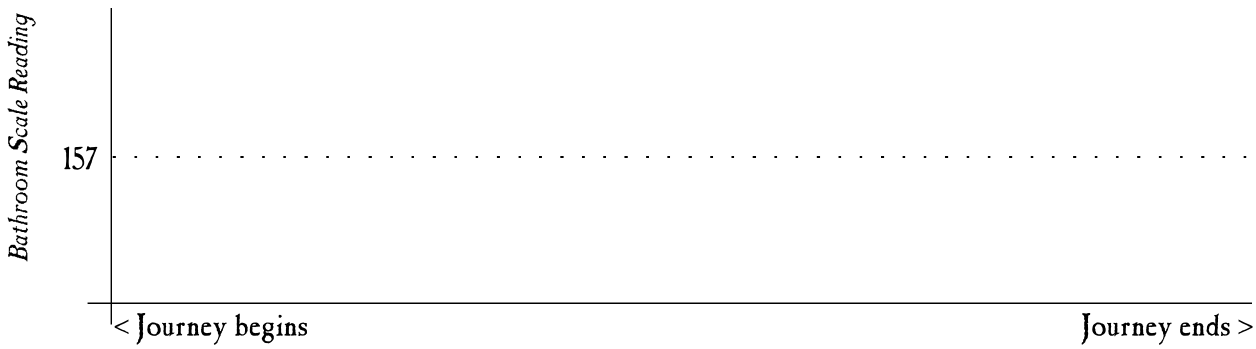
d. Draw force diagrams below: one when "Elevator Man" is at rest, one when "Elevator Man" is moving downward and speeding up, one when "Elevator Man" is moving downward with constant speed, one when "Elevator Man" is moving downward and slowing down.



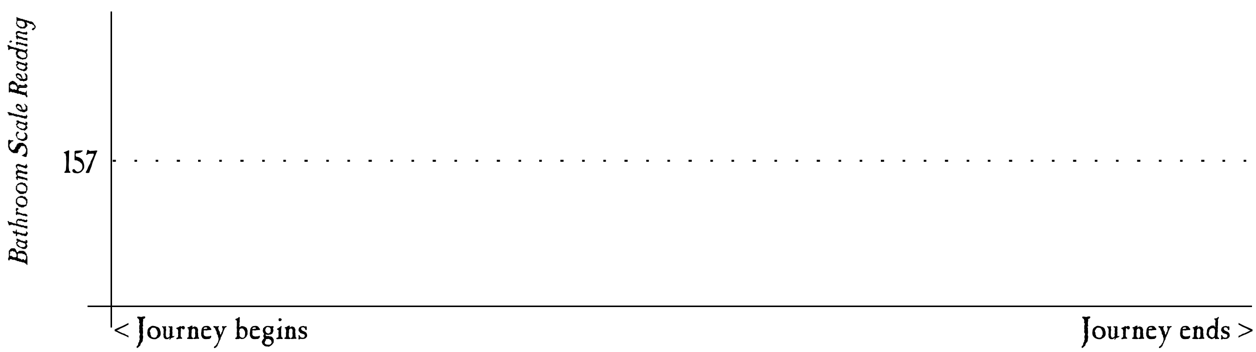
3. Prediction. Suppose you are standing on a bathroom scale as you ride the elevator. And suppose you weigh 157 lbs. Make a chart of the reading on the bathroom scale as you ride from the ground floor to the top floor vs. time.



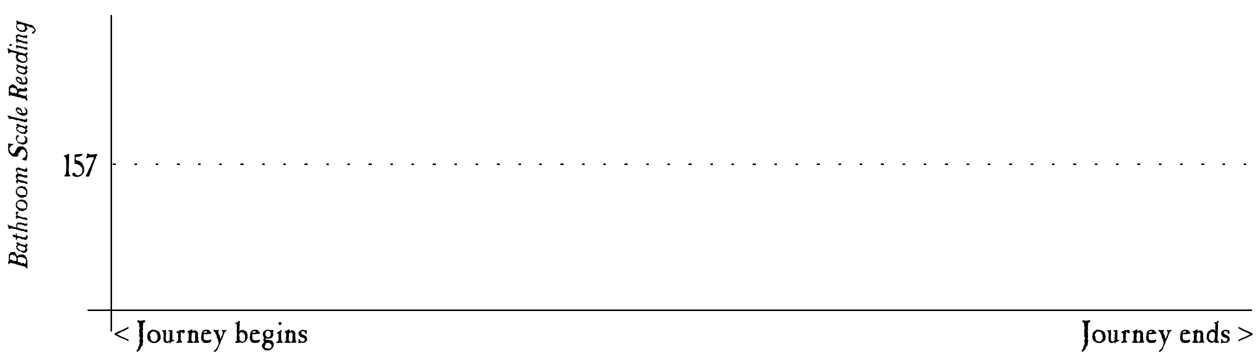
4. Observation. What actually *does* happen to the reading on the bathroom scale as 157 lb "Elevator Man" travels from the first floor to the tenth floor of the swanky '60s building?



5. Prediction. Suppose you are standing on a bathroom scale as you ride the elevator. And suppose you weigh 157 lbs. Make a chart of the reading on the bathroom scale as you ride from the top floor to the ground floor vs. time.



6. Observation. What actually *does* happen to the reading on the bathroom scale as 157 lb "Elevator Man" travels from the tenth floor to the first floor of the swanky '60s building?



7. Complete each statement by checking the appropriate terms.

a. Elevator Man's apparent weight is greater than his actual weight whenever the elevator's
___velocity ___acceleration is ___upward ___downward ___zero ___increasing ___decreasing ___constant.

b. Elevator Man's apparent weight is equal to his actual weight whenever the elevator's
___velocity ___acceleration is ___upward ___downward ___zero ___increasing ___decreasing ___constant. In other words, whenever the elevator's
___velocity ___acceleration is ___upward ___downward ___zero ___increasing ___decreasing ___constant.

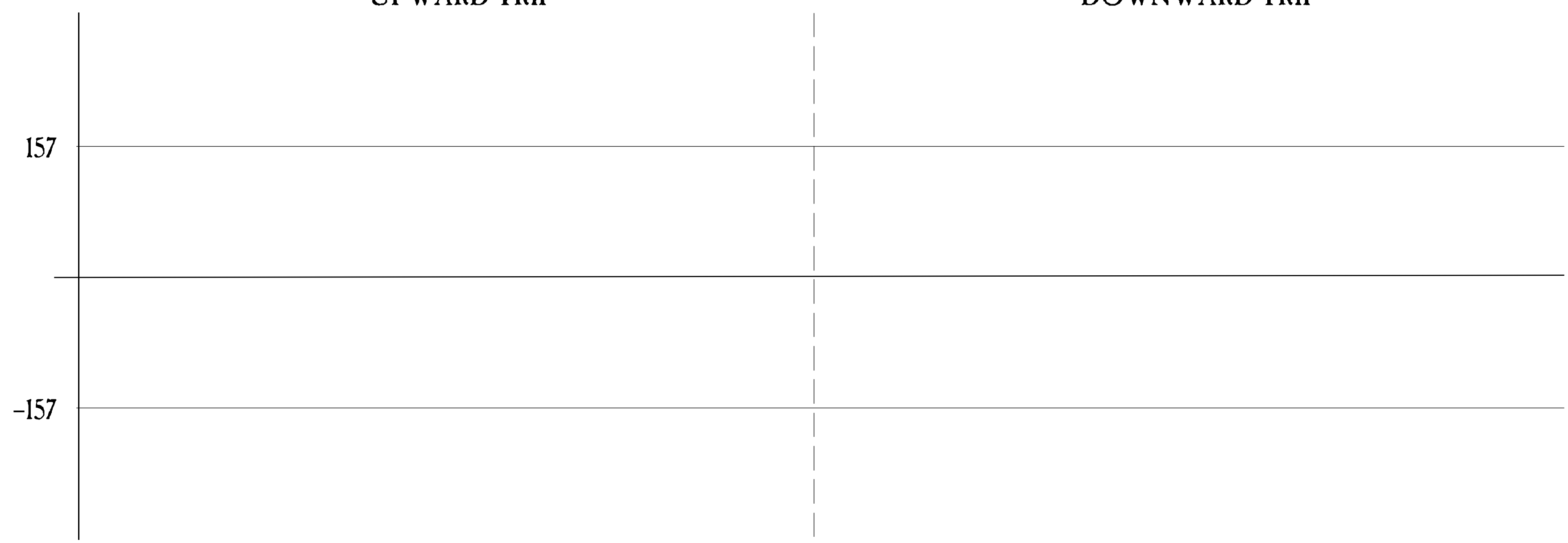
c. Elevator Man's apparent weight is less than his actual weight whenever the elevator's
___velocity ___acceleration is ___upward ___downward ___zero ___increasing ___decreasing ___constant.

8. On the axes below, plot and label lines showing the

a. apparent weight vs. clock reading b. actual weight vs. clock reading c. net force vs. clock reading

as they apply to "Elevator Man" during his upward and downward journeys. Remember that direction is indicated by sign (up is positive; down is negative).

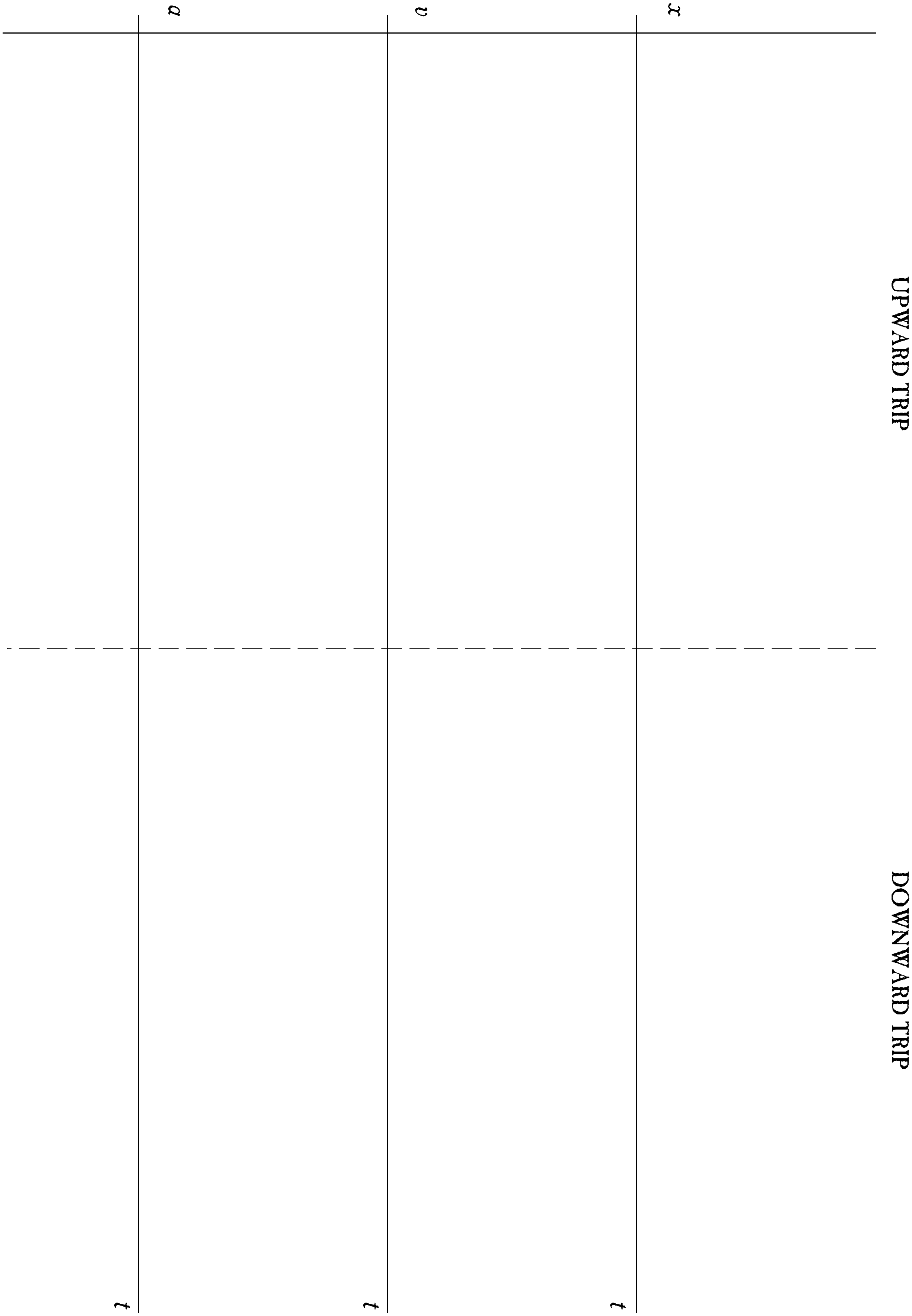
UPWARD TRIP DOWNWARD TRIP



9. On the axes on the other side of this sheet, plot the kinematics graphs of "Elevator Man" during his upward and downward journeys. Hints:

a. Don't start with position vs. clock reading.

b. In *PhyzLab: Putting the Force Before the Cart,* you plotted (net) force, velocity, and acceleration vs. clock reading. You found that two of those three consistently matched each other. Which two were they? Considering the plot you just completed above, which kinematics graph might you wish to start with?


UPWARD TRIP
DOWNWARD TRIP
x
v
a
t
t
t

