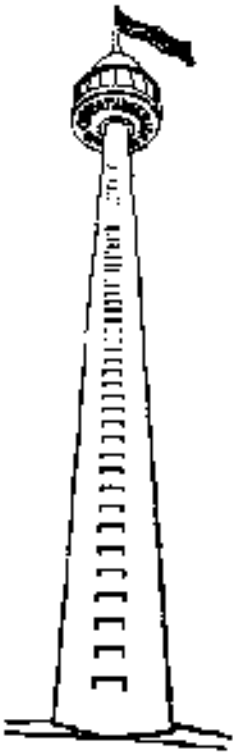
# SKY TREK TOWER



1. The Sky Trek is rising. For this motion (please support your answers):

   (a) Is the upward force of the cable constant or changing?

   (b) Is the kinetic energy of the elevator constant or changing?

   (c) Is the potential energy of the elevator constant or changing?

   (d) Is the acceleration of the elevator zero, a constant other than zero, or changing?

   (e) Is the T M E (kinetic energy + potential energy) constant, zero, or changing?

2. The Sky Trek is descending. For this motion please answer questions (a) through (e) above.

3. What is the average velocity of the Sky Trek for one round trip?

4. What is the average speed of the Sky Trek for one round trip?

5. What is the average angular velocity of the Sky Trek for one round trip?

6. Find the height of the Sky Trek using triangulation procedures. Estimate the mass of the Sky Trek with passengers. Calculate the potential energy of the Sky Trek at the top with passengers. Assume the mass of each rider to be 60 kg.

7. When the Sky Trek reaches the top it rotates with a constant angular velocity. Assume an object is released inside the cab at arms length. Describe the motion of the dropped object with respect to a person inside the cab. Describe the motion of the dropped object with respect to a person fixed to the earth's frame of reference. If the object was dropped out over the edge of the Sky Trek, describe the dropped objects motion as seen by an observer in the rotating cab and by an observer in the earths frame of reference.

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8. Rain drops are dripping from the bottom of the Sky Trek while the Sky Trek is moving upward. Describe the motion of the raindrops with respect to an observer fixed to the earth's frame of reference.

9. Assume you are sitting on a bathroom scale while riding the Sky Trek. Describe during what part of the ride the bathroom scale would read:

   (a) Higher than your true weight.

   (b) Less than your true weight.

   (c) Equal to your true weight.

10. Describe the motion of a bouncing tennis ball inside the cabin while the Sky Trek is ascending to the top.

11. What advantages are there to designing the Sky Trek like an elevator with a counterweight?

12. When the Sky Trek reaches the top, which component of the velocity vector becomes zero?