

CIEG 305 Homework #4 Due **Friday September 28, 2007**



1. P2.45 White
2. P2.52 White 5<sup>th</sup> edition: A vertical lock gate is 4m wide and separates 20 degree C water levels of 2m and 3 m respectively. Find the moment about the bottom required to keep the gate stationary.
3. P2.82 White. For location, determine where each force acts and the angle of the resultant.
4. P2.86 White. Here you will have to determine where the vertical force acts using the figure on page 81.
5. Larry Walters of Los Angeles is one of the few to contend for the Darwin Awards and live to tell the tale. "I have fulfilled my 20-year dream," said Walters, a former truck driver for a company that makes TV commercials. "I'm staying on the ground. I've proved the thing works."

Larry's boyhood dream was to fly. But fates conspired to keep him from his dream. He joined the Air Force, but his poor eyesight disqualified him from the job of pilot. After he was discharged from the military, he sat in his backyard watching jets fly overhead.

He hatched his weather balloon scheme while sitting outside in his "extremely comfortable" Sears lawnchair. He purchased 45 weather balloons from an Army-Navy surplus store, tied them to his tethered lawnchair dubbed the Inspiration I, and filled the **4' diameter balloons with helium**. Then he strapped himself into his lawnchair with some sandwiches, Miller Lite, and a pellet gun. He figured he would pop a few of the many balloons when it was time to descend.

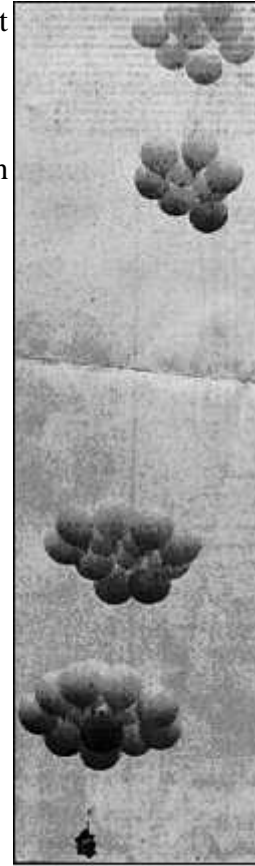
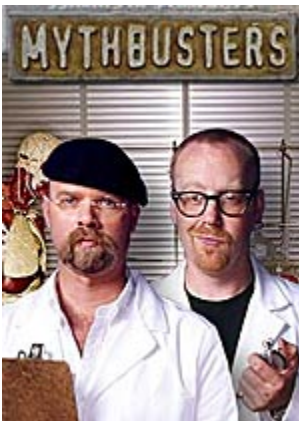
Larry's plan was to sever the anchor and lazily float up to a height of about 30 feet above his back yard, where he would enjoy a few hours of flight before coming back down. But things didn't work out quite as Larry planned.

When his friends cut the cord anchoring the lawnchair to his Jeep, he did not float lazily up to 30 feet. Instead, he streaked into the LA sky as if shot from a cannon, **pulled by the lift of 42 helium balloons holding 33 cubic feet of helium each**. He didn't level off at 100 feet, nor did he level off at 1000 feet. After climbing and climbing, he leveled off at 16,000 feet.

At that height he felt he couldn't risk shooting any of the balloons, lest he unbalance the load and really find himself in trouble. So he stayed there, drifting cold and frightened with his beer and sandwiches, for more than 14 hours. He crossed the primary approach corridor of LAX, where Trans World Airlines and Delta Airlines pilots radioed in reports of the strange sight.

Eventually he gathered the nerve to shoot a few balloons, and slowly descended. The hanging tethers tangled and caught in a power line, blacking out a Long Beach neighborhood for 20 minutes. Larry climbed to safety, where he was arrested by waiting members of the LAPD. As he was led away in handcuffs, a reporter dispatched to cover the daring rescue asked him why he had done it. Larry replied nonchalantly, "A man can't just sit around."

The Federal Aviation Administration was not amused. Safety Inspector Neal Savoy said, "We know he broke some part of the Federal Aviation Act, and as soon as we decide which part it is, a charge will be filed."



Associated Press

**Based on the information given, is this story plausible?**

**Assume a reasonable weight for Lawnchair Larry, the chair, balloons, beer and food and a typical density for air (do not be concerned with the exact elevation he reached, rather could he get off the ground).**

$$\gamma_{\text{helium}} = 0.01 \text{ lb/ft}^3$$

Look at the photo again, the diameter of the balloons looks More like 8ft than 4ft. How does that affect your calculations?

Extra Credit:

P2.62 White