## Problem 1

Steel is very stiff and the Young's Modulus for steel is unusually large. A cube of steel, with sides of length d, supports a load of mass M on its side. The mass, M, has the same horizontal cross section as the steel cube.

- 1. What is the magnitude of the "normal" force that the steel cube exerts on the load?
- 2. What is the compression of the steel cube? That is, what is the small change in height of the steel cube due to the load it supports? If d is about 1m, the load is about 100kg, and Young's modulus for steel is  $10^{11} \frac{N}{m^2}$ , what is the compression?

## Problem 2

Suppose that all the people of the earth go to the North Pole and, on a signal, all jump straight up. Estimate the recoil speed of the earth. (Hint: The mass of the earth is  $6 \times 10^{24}$  kg.)