3. A pirate in a movie is carrying a chest (0.30 m × 0.30 m × 0.20 m) that is supposed to be filled with gold. To see how ridiculous this is, determine the weight (in newtons) of the gold. To judge how large this weight is, remember that 1 N = 0.225 lb.

10. A glass bottle of soda is sealed with a screw cap. The absolute pressure of the carbon dioxide inside the bottle is $1.80 \times 10^5$ Pa. Assuming that the top and bottom surfaces of the cap each have an area of $4.10 \times 10^{-4} \text{m}^2$, obtain the magnitude of the force that the screw thread exerts on the cap in order to keep it on the bottle. The air pressure outside the bottle is one atmosphere.

20. At a given instant, the blood pressure in the heart is $1.6 \times 10^4$ Pa. If an artery in the brain is 0.45 m above the heart, what is the pressure in the artery? Ignore any pressure changes due to blood flow.