



## Problem of the Week

### Problem B

#### Water, Water, Everywhere...

Very little of Earth's fresh water is accessible for human consumption, particularly in dry countries, making alternative sources necessary.

- (a) The per capita (per person) daily water consumption for nine different countries is given below.

155 L, 251 L, 200 L, 147 L, 135 L, 235 L, 373 L, 145 L, 380 L

What is the average per capita daily water consumption for these countries? Round your answer to the nearest whole number.

- (b) A small city of 110 000 people in an arid (very dry) country obtains its fresh water by desalination of sea water. If the per capita consumption in this city is equal to the average from part (a), how much fresh water must be produced each day by the city's desalination plant?
- (c) Sea water is 3.5% salt; the remaining 96.5% is fresh water. Thus, if 1000 L of sea water was desalinated, the amount of fresh water produced would be  $0.965 \times 1000 = 965$  L. In general, we can use the following equation to show the relationship between the amount of sea water and fresh water in the desalination process.

$$0.965 \times \text{amount of sea water} = \text{amount of fresh water}$$

Use this equation and your answer from part (b) to find the amount of sea water that must be processed by the desalination plant every day in order to fulfill the city's fresh water needs.

