

## Problem of the Week

### Problem B

### My How You've Grown, eh?

#### Problem

In 1970, the population of Canada was estimated at 21.32 million people. In 2010, the population was estimated to be 34.01 million.

- If Canada continues to grow at the same rate as this data predicts, what will be its population in 2030?
- If this rate of growth persists, when will Canada reach a population of 50 million?



#### Solution

- The given data states that, over the four decades from 1970 to 2010, Canada's population increased by 12 690 000 ( $34\,010\,000 - 21\,320\,000$ ) people, or

$$12\,690\,000 \div 4 = 3\,172\,500 \text{ people per decade.}$$

Since 2030 is another two decades after 2010, we would expect an addition to the population of size  $3\,172\,500 \times 2 = 6\,345\,000$  people. Thus the total population predicted for 2030 would be

$$34\,010\,000 + 6\,345\,000 = 40\,355\,000 \text{ people.}$$

- The additional population in the three decades from 2030 to 2060 would be  $3\,172\,500 \times 3 = 9\,517\,500$ , giving total population

$$40\,355\,000 + 9\,517\,500 = 49\,872\,500 \text{ by 2060.}$$

The predicted annual growth is  $3\,172\,500 \div 10 = 317\,250$  people per year. Thus, by 2061, the total population would be

$$49\,872\,500 + 317\,250 = 50\,189\,750.$$

So the 50 million mark would be surpassed some time in 2061.

