Problem

The Rideau Canal system is 202 km long, running from Ottawa, the capital of Canada, to Kingston, on Lake Ontario. During the winter, 7.8 km of the frozen canal are cleared within the city of Ottawa for skating.

a) The fastest skater in the 2009 NHL Skills Competition was Andrew Cogliano, who skates about 35.78 km per hour. How long would it take him to skate the cleared portion of the canal? Give your answer in both hours and minutes.

b) Jeremy Wotherspoon, one of Canada's fastest speed skaters, skates about 52.89 km per hour. Usain Bolt, the fastest runner in the world in 2011, can run 100 m in 9.69 seconds. If Jeremy skates the cleared length of the canal while Usain runs along the parallel path along the bank, who will take the least amount of time?

Hints

Hint 1 - How many minutes are there in one hour?

Hint 2 - How many seconds are there in one hour?

Solution

a) Since he skates at 35.78 km per hour, it would take Andrew Cogliano $7.8 \div 35.78 \approx 0.218$ hours to skate the cleared length of the Rideau Canal. Since there are 60 minutes in an hour, this is about $0.218 \times 60 \approx 13.08$ minutes.

b) Since he can run 100 m in 9.69 seconds, Usain Bolt can run 1 km in 96.9 seconds. Thus his speed is $1 \div 96.9 \approx 0.01032$ km per second. Since there are 3600 seconds in 1 hour, this is about $0.01032 \times 3600 \approx 37.15$ km per hour, which is slower than Jeremy Wotherspoon can skate. So Jeremy will take less time.

[Students may also calculate Usain Bolts' time directly, as 7.8 km $\times$ 96.9 seconds per km $= 755.82$ seconds $\equiv 755.82 \div 60 \approx 12.56$ minutes.]