

**MA311**  
ASSIGNMENT 1  
2000

PADDLE YOUR OWN CANOE

A canoeist wishes to cross a straight river from a point on one bank to a point 100 metres downstream on the opposite bank and then return to his starting point.

The river is 100 metres wide, and is flowing with velocity

$$v(x) = \frac{x(100 - x)}{1000} \text{ metres/second}$$

where  $x$  is the distance in metres from the bank.

The velocity is uniform in the direction of the flow.

If he paddles his canoe at a steady speed of 2 metres/second, what route should he take to complete the round trip in the least possible time/