1 Fig. 1.1 shows a straight section of a river where the water is flowing from right to left at a speed of 0.54 m / s.

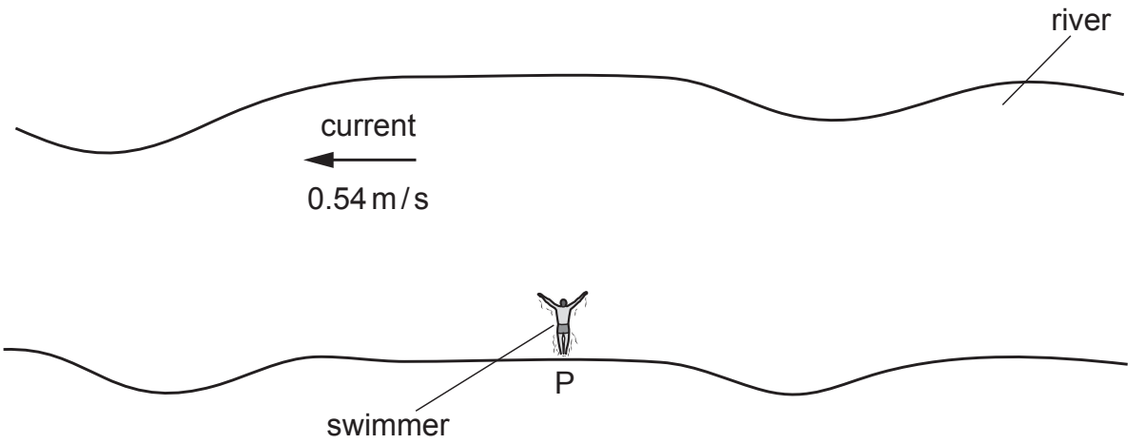

Fig. 1.1 (not to scale)

A swimmer starts at point P and swims at a constant speed of 0.72 m / s relative to the water and at right angles to the current.

(a) (i) Determine, relative to the river bank, both the magnitude and direction of the swimmer's velocity.

magnitude of velocity = ...

direction of velocity .....

[4]

(ii) After 1.5 minutes, the swimmer reaches point Q.

Calculate the distance between P and Q.

distance = ... [3]

(b) When the swimmer is crossing the river, his actions produce a constant forward force on his body.

Explain why he moves at a constant speed.

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.....

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..... [2]

[Total: 9]