25 A particle P is moving along a straight line.

At time t seconds, $t \geqslant 0$, the displacement, x metres, of P from a fixed point O on the line is given by

$$x = k + 6t - 2kt^2$$

where k is a constant.

When $t = 0$, P is at the point A on the line.
When P is at the point B on the line, P is instantaneously at rest.

Given that $AB = 0.9\,\text{m}$, calculate the value of k.
Show your working clearly.

$k =$ .....

(Total for Question 25 is 5 marks)