1. **In this question you must show all stages of your working.**
Solutions relying entirely on calculator technology are not acceptable.

A particle P is moving along the positive x-axis.
At time t seconds, $t \geqslant 0$, P is x metres from the origin O and is moving away from O with velocity $v\,\text{m s}^{-1}$, where

$$v = \frac{6}{x^2 + 4}$$

(a) Find the deceleration of P when $x = 3$

(4)

When $t = 0$, $x = 3$

When $t = T$, $x = 6$

(b) Find the value of T.

(5)

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Question 1 continued

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Question 1 continued

(Total for Question 1 is 9 marks)