9 In this question, all lengths are in metres and time is in seconds.

A particle, P, moves in a straight line such that t seconds after passing through a fixed point O its displacement, s, is given by $s = 5\ln(2t+1) - 5t$.

(a) Find the value of t for which P is instantaneously at rest. [4]

(b) Find the distance P travels between $t = 0$ and $t = 2$. [4]

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(c) Find an expression for the acceleration of P in terms of t. [2]

(d) Find the acceleration when $t = 4.5$. [1]

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10 The expansion of $(ax-2)^4\left(1+\frac{b}{x}\right)^3$ is written in descending powers of x.

The first 3 terms of this expansion are $81x^4+999x^3+cx^2$.
It is given that a, b and c are positive integers.

Find the values of a, b and c. [10]

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