6 A particle P is moving in a straight line. The displacement s of P, in metres, at time t seconds, $t \ge 0$, is given by

$$s = e^{2t} \sin 3t + 2$$

At time t = 0, P is at the point A and at time $t = \frac{\pi}{6}$, P is at the point B

(a) Find the exact distance AB

(2)

(b) Find the exact velocity of *P* when $t = \frac{\pi}{3}$

(4)

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Question 6 continued
(Total for Question 6 is 6 marks)

