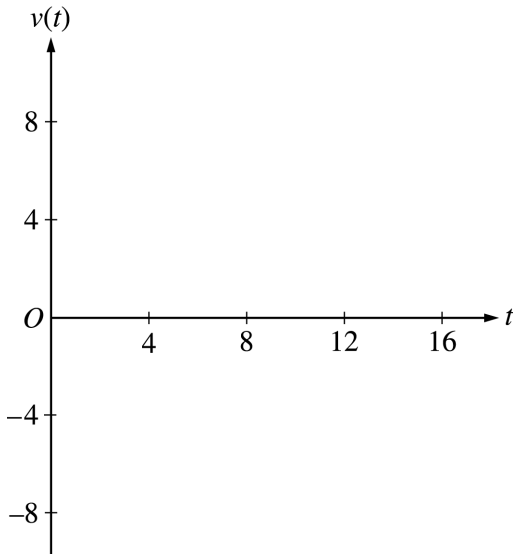
3. A particle moves along the x-axis so that its velocity v at any time t, for $0 \le t \le 16$, is given by $v(t) = e^{2\sin t} - 1$. At time $t = 0$, the particle is at the origin.

   (a) On the axes provided, sketch the graph of $v(t)$ for $0 \le t \le 16$.
   (Note: Use the axes provided in the test booklet.)



   (b) During what intervals of time is the particle moving to the left? Give a reason for your answer.

   (c) Find the total distance traveled by the particle from $t = 0$ to $t = 4$.

   (d) Is there any time t, $0 < t \le 16$, at which the particle returns to the origin? Justify your answer.

END OF PART A OF SECTION II