

**1989 AB3**

A particle moves along the  $x$ -axis in such a way that its acceleration at time  $t$  for  $t \geq 0$  is given by  $a(t) = 4\cos(2t)$ . At time  $t = 0$ , the velocity of the particle is  $v(0) = 1$  and its position is  $x(0) = 0$ .

- (a) Write an equation for the velocity  $v(t)$  of the particle.
- (b) Write an equation for the position  $x(t)$  of the particle.
- (c) For what values of  $t$ ,  $0 \leq t \leq \pi$ , is the particle at rest?