

- 5** A particle P moves along a straight line in such a way that at time t seconds P has velocity $v \text{ m s}^{-1}$, where

$$v = 12 \cos t + 5 \sin t.$$

- (a)** Express v in the form $R \cos(t - \alpha)$, where $R > 0$ and $0 < \alpha < \frac{1}{2}\pi$. Give the value of α correct to 4 significant figures. **[3]**
- (b)** Hence find the two smallest positive values of t for which P is moving, in either direction, with a speed of 3 m s^{-1} . **[3]**