2. A particle P moves with acceleration $(4\mathbf{i} - 5\mathbf{j})\,\mathrm{m\,s^{-2}}$

   At time $t = 0$, P is moving with velocity $(-2\mathbf{i} + 2\mathbf{j})\,\mathrm{m\,s^{-1}}$

   (a) Find the velocity of P at time $t = 2$ seconds.

   (2)

   At time $t = 0$, P passes through the origin O.

   At time $t = T$ seconds, where $T > 0$, the particle P passes through the point A.

   The position vector of A is $(\lambda\mathbf{i} - 4.5\mathbf{j})\,\mathrm{m}$ relative to O, where λ is a constant.

   (b) Find the value of T.

   (4)

   (c) Hence find the value of λ

   (2)