1C Momentum as a Vector (Not AS)

1. A particle of mass 0.2kg is moving with velocity $(10\boldsymbol{i} - 5\boldsymbol{j})\ ms^{-1}$ when it receives an impulse $(3\boldsymbol{i} - 2\boldsymbol{j})\ Ns$. Find the new velocity of the particle.

2. An ice hockey puck of mass 0.17kg receives an impulse **Q** Ns. Immediately before the impulse the velocity of the puck is $(10\boldsymbol{i} + 5\boldsymbol{j})\ ms^{-1}$ and immediately afterwards its velocity is $(15\boldsymbol{i} - 7\boldsymbol{j})\ ms^{-1}$. Find the magnitude of **Q** and the angle between **Q** and **i**.

3. A particle of mass 0.15kg is moving with velocity $(20\boldsymbol{i} - 10\boldsymbol{j})\ ms^{-1}$ when it collides with a particle of mass 0.25kg moving with velocity $(16\boldsymbol{i} - 8\boldsymbol{j})\ ms^{-1}$. The two particles coalesce and form one particle of mass 0.4kg. Find the velocity of the combined particle.