35. Both proofs shown below utilize the fact that the vector (cross) product of $\vec{a}$ and $\vec{b}$ is perpendicular to both $\vec{a}$ and $\vec{b}$. This is mentioned in the book, and is fundamental to its discussion of the right-hand rule.

   (a) $(\vec{b} \times \vec{a})$ is a vector that is perpendicular to $\vec{a}$, so the scalar product of $\vec{a}$ with this vector is zero. This can also be verified by using Eq. 3-30, and then (with suitable notation changes) Eq. 3-23.

   (b) Let $\vec{c} = \vec{b} \times \vec{a}$. Then the magnitude of $\vec{c}$ is $c = ab \sin \phi$. Since $\vec{c}$ is perpendicular to $\vec{a}$ the magnitude of $\vec{a} \times \vec{c}$ is ac. The magnitude of $\vec{a} \times (\vec{b} \times \vec{a})$ is consequently $|\vec{a} \times (\vec{b} \times \vec{a})| = ac = a^2 b \sin \phi$. This too can be verified by repeated application of Eq. 3-30, although it must be admitted that this is much less intimidating if one is using a math software package such as MAPLE or Mathematica.