Exercise 1
Show that the vectors $\vec{A} = 3\hat{\imath} - 5\hat{\jmath} + 2\hat{k}$ and $\vec{B} = 2\hat{\imath} + 4\hat{\jmath} + 7\hat{k}$ are orthogonal.

Exercise 2
Find a unit vector which is perpendicular to the plane containing the vectors $2\hat{\imath} - \hat{\jmath} - \hat{k}$ and $\hat{\imath} + 2\hat{\jmath} + \hat{k}$ [Ans. $(1/\sqrt{35}(\hat{\imath} - 3\hat{\jmath} + 5\hat{k})$]

Exercise 3
Vector $\vec{A} = 3\hat{\imath} - 5\hat{\jmath} + 2\hat{k}$ and $\vec{B} = 6\hat{\imath} + \alpha\hat{\jmath} + \beta\hat{k}$. Find the values of α and β such that the vectors are parallel   [Ans. $\alpha = -10, \beta = 4.$]

Exercise 4
Prove the following vector identity which is very useful and often used $\vec{A} \times (\vec{B} \times \vec{C}) = \vec{B}(\vec{A} \cdot \vec{C}) - \vec{C}(\vec{A} \cdot \vec{C})$ For ease of remembering this formula is often known as bac-cab formula.

Exercise 5
Show that the cross product of vectors satisfy the transformation property stated above.