> Please show **all** your work! Answers without supporting work will not be given credit.
> **Clearly mention what theorem(s), if any, you are using.**
> Write answers in spaces provided.
> You have 10 minutes to complete this Quiz.
> You can get MAXIMUM $(4 + 3 + 3) = 10$ marks.

Name:

Suppose $\vec{a}$ and $\vec{b}$ are two unit vectors such that $\vec{u} = 3\vec{a} + 2\vec{b}$ and $\vec{v} = \vec{a} - 4\vec{b}$ are perpendicular.

1. Find $\vec{a} \cdot \vec{b}$.

2. Find the angle between $\vec{a}$ and $\vec{b}$.

3. Find $Proj_{\vec{b}}(\vec{u})$ i.e. the projection of $\vec{u}$ on to $\vec{b}$.