

Assignment 2

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Q15(a) :If \vec{a} and \vec{b} are perpendicular vectors,
 $|\vec{a} + \vec{b}| = 13$ and $|\vec{a}| = 5$ and find the value of $|\vec{b}|$.

Solution: Given, \vec{a} and \vec{b} are perpendicular vectors
 so, angle between \vec{a} and \vec{b} is 90° .

Also, $|\vec{a} + \vec{b}| = 13$ and $|\vec{a}| = 5$

$$|\vec{a} + \vec{b}|^2 = |\vec{a}|^2 + |\vec{b}|^2 + 2|\vec{a}| \cdot |\vec{b}| \cos \theta$$

$$|\vec{b}|^2 = \frac{|\vec{a} + \vec{b}|^2 - |\vec{a}|^2}{2|\vec{a}| \cdot |\vec{b}| \cos \theta}$$

$$|\vec{b}|^2 = \frac{13^2 - 5^2}{2 \times 5 \times \cos 90^\circ}$$

$$|\vec{b}|^2 = 144$$

$$\therefore |\vec{b}| = 12.$$