Phys. 101 – Fall (041) - Sec # 3

Quiz # 2 (Ch. 3)

Name: Key ID #

1- Two vectors L and M, are defined by L =(4 i – 8 j) m and M = (8 i + 2 j) m. Find the magnitude and direction of vector C = (2L – M).

$\vec{C} = 2(4\hat{i} - 8\hat{j}) - (8\hat{i} + 2\hat{j})$

$= 8\hat{i} - 16\hat{j} - 8\hat{i} - 2\hat{j}$

$= -18\hat{j}$

$|C| = \sqrt{18^2 + 0^2} = \boxed{18 \text{ m}}$

- direction 270° from +ve X-axis (counterclockwise)
- (along -ve y-axis)

2- Find the angle between the two vectors L and M.

We use the scalar (dot) Product :-

$\vec{L} \cdot \vec{M} = |L|\,|M| \cos\phi$

$32 - 16 = \sqrt{4^2+8^2} * \sqrt{8^2+2^2} * \cos\phi$

$16 = \sqrt{80} * \sqrt{68} * \cos\phi$

$\Rightarrow \cos\phi = \frac{16}{\sqrt{80} * \sqrt{68}} = \frac{16}{73.8}$

$\phi = \cos^{-1}\left(\frac{16}{73.8}\right) = \boxed{77.5^\circ}$