**Answer on Question #69880 Physics / Other**

Two vectors of equal magnitude 5 units have an angle $\alpha = 60$ degree between them. Find the magnitude of the sum of the vectors and difference of the vectors.

**Solution:**

Let us denotes vectors us **a** and **b**. Thus

$$|\mathbf{a}+\mathbf{b}|^2 = (\mathbf{a}+\mathbf{b})^2 = a^2 + 2ab\cos\alpha + b^2 = 5^2 + 2\times5\times5\times\frac{1}{2} + 5^2 = 75.$$

$$|\mathbf{a}+\mathbf{b}| = \sqrt{75} = 5\sqrt{3}.$$

$$|\mathbf{a}-\mathbf{b}|^2 = (\mathbf{a}-\mathbf{b})^2 = a^2 - 2ab\cos\alpha + b^2 = 5^2 - 2\times5\times5\times\frac{1}{2} + 5^2 = 25.$$

$$|\mathbf{a}-\mathbf{b}| = \sqrt{25} = 5.$$

**Answers:** $|\mathbf{a}+\mathbf{b}| = \sqrt{75} = 5\sqrt{3}$,

$|\mathbf{a}-\mathbf{b}| = \sqrt{25} = 5.$