Vectors- Questions

May 2019 Mathematics Advanced Paper 1: Pure Mathematics 1

1.

   (i) Two non-zero vectors, **a** and **b**, are such that

   $$|\mathbf{a} + \mathbf{b}| = |\mathbf{a}| + |\mathbf{b}|$$

   Explain, geometrically, the significance of this statement.

   (1)

   (ii) Two different vectors, **m** and **n**, are such that $|\mathbf{m}| = 3$ and $|\mathbf{m} - \mathbf{n}| = 6$
   The angle between vector **m** and vector **n** is $30°$

   Find the angle between vector **m** and vector $\mathbf{m} - \mathbf{n}$, giving your answer, in degrees, to one decimal place.

   (4)

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2.

   Given that the point A has position vector $4\mathbf{i} - 5\mathbf{j}$ and the point B has position vector $-5\mathbf{i} - 2\mathbf{j}$,

   (a) find the vector $\overrightarrow{AB}$,

   (2)

   (b) find $|\overrightarrow{AB}|$.

   Give your answer as a simplified surd.

   (2)