1-3)

A = 4***i*** + 3***j*** **B** = 5***i*** - 2***j***

a)

$A = [A_x^2 + A_y^2]^{1/2} = [4^2 + 3^2]^{1/2} =$ 5 (no units)

$B = [B_x^2 + B_y^2]^{1/2} = [5^2 + (-2)^2]^{1/2} =$ 5.39 (no units)

b)

A - **B** = 4***i*** + 3***j*** - (5***i*** - 2***j***) = (4 - 5) ***i*** + (3 - ⁻2) ***j*** = **-** ***i*** **+** 5***j***

$(\mathbf{A} - \mathbf{B})_x = -1$

$(\mathbf{A} - \mathbf{B})_y = 5$

$|\mathbf{A} - \mathbf{B}| = [(A - B)_x^2 + (A - B)_y^2]^{1/2} = [(-1)^2 + (5)^2]^{1/2} =$ 5.1

$\theta_{\mathbf{A-B}} = \arctan((A - B)_y/(A - B)_x) = \arctan(5/-1) = \arctan(-5) = -78.7^o$. Check the quadrant: since x is negative but y is positive, the angle is in QII and 180^o must be added to give the correct angle, so,

$\theta_{\mathbf{A-B}} =$ 101.3^o.