Universiti Malaysia PAHANG	**SUBJECT:** Mechanics & Thermodynamics			**MARKS**: /10
	TOPIC: Vectors		**CODE:** BSP1153	
	ASSESSMENT: QUIZ	**NO:** 1	**DURATION:** 15 MINUTES	
NAME: **SECTION:**			**STUDENT ID:**	

Answer ALL questions.

1. The following vectors have the length 4.0 units. What are the x- and y-components of this vector. (4 Marks)

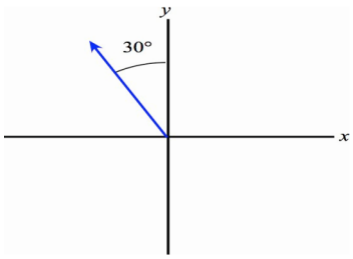

Figure 1

x-component: 4 cos 120^o = -2

y-component: 4 sin 120^o = 3.46

2. Given that **A** = −5**i** − 3**j** + 2**k** and B = −2**j** − 2**k**.
   i) Find the magnitude of **A** and **B**. (2 Marks)

$$A = \sqrt{A_x^2 + A_y^2 + A_z^2} = \sqrt{(-5)^2 + (-3)^2 + (2)^2} = 6.164$$

$$B = \sqrt{B_x^2 + B_y^2 + B_z^2} = \sqrt{(0)^2 + (-2)^2 + (-2)^2} = 2.828$$

   ii) Find the dot product of **A** and **B.** (2 Marks)

$$\mathbf{A} \cdot \mathbf{B} = A_x B_x + A_y B_y + A_z B_z = (-5)(0) + (-3)(-2) + (2)(-2) = 2$$

   iii) Find the angle between **A** and **B**. (2 Marks)

$$\cos\phi = \frac{\mathbf{A} \cdot \mathbf{B}}{AB} = \frac{2}{(6.164)(2.828)} = 0.114$$

$$\phi = 83.4^\circ \ .$$