

## Quiz 10

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

## Question 1. §3.1

9b. (2 marks) Find the initial point of the vector that is equivalent to  $\vec{u} = (1, 1, 3)$  and whose terminal point is  $B(-1, -1, 2)$ .

$$\vec{AB} = \vec{u}$$

$$B - A = \vec{u}$$

$$B - \vec{u} = A$$

$$A = (-1, -1, 2) - (1, 1, 3)$$

$$= (-2, -2, -1)$$

10b. (2 marks) Find the terminal point of the vector that is equivalent to  $\vec{u} = (1, 1, 3)$  and whose initial point is  $A(0, 2, 0)$ .

$$\vec{AB} = \vec{u}$$

$$B - A = \vec{u}$$

$$B = A + \vec{u}$$

$$B = (0, 2, 0) + (1, 1, 3)$$

$$= (1, 3, 3)$$

Question 2. §3.2 #18b (2 marks) Determine whether the expression makes sense mathematically. If not, explain why.

$$(\vec{u} \cdot \vec{v}) - \vec{w}$$

↑ scalar      ← vector

Does not make sense, since you can not add scalars and vectors.

Question 3. §3.2 #23b (4 marks) Find the cosine of the angle  $\theta$  between  $\vec{u} = (-6, -2)$  and  $\vec{v} = (4, 0)$ .

$$\vec{u} \cdot \vec{v} = \|\vec{u}\| \|\vec{v}\| \cos \theta$$

$$(-6)(4) + (-2)(0) = \sqrt{(-6)^2 + (-2)^2} \sqrt{4^2 + 0^2} \cos \theta$$

$$\cos \theta = \frac{-24}{\sqrt{40} \sqrt{16}} = \frac{-24}{4\sqrt{40}} = \frac{-6}{\sqrt{40}} = \frac{-3}{\sqrt{10}}$$