**Petroleum Seismology, spring 2010**

**Homework #1**

Purpose: **Review Vector Algebra**

**Q. 1** For three given vectors, **a,b,c,** show that the following identities hold true



 (1)







where 

Let us check for the 3-d case:

Assume:  


1. 

Proof:



1. 

Proof:



1. 

Proof:



1. 

**Proof:**



The same calculation will apply to the third one, I will not show it here

1. 

Proof:



**Q 2** Express, in matrix form, the rotation of vector b by 900 clockwise. Do include a diagram to illustrate the rotation.

Solution:

For a general case, let us assume we rotate the vector by  clockwise, here is the diagram

We have



Please see the right for the diagram.