### **Content:**

Declaration

Acknowledgment

**Abstract** 

- 1) Vector and product of vectors
- 2) Scalar product of vectors
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    - 2.1.1) Case: Perpendicular vectors
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    - 2.1.3) Angle between two vectors
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Scalar projection

Associative law

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Distributive law

- 3) Observation
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## 1 Objective:

To write four compound statements by using two simple mathematical statements.

## 2 Procedure/ Explanation:

In any triangle ABC,

$$\mathbf{p}: a = b\cos C + c\cos B$$

$$q: b = c \cos A + a \cos C$$

Here, p and q are two simple statements. Both of them are true mathematical statements regarding projection law in a triangle. The compound statements that can be formed using statements p and q are as follows:

## 2.1 $\mathbf{p} \wedge \mathbf{q}$

$$a = b \cos C + c \cos B$$
 AND  $b = c \cos A + a \cos C$ 

Truth table:

p	q	$p \wedge q$
T	Т	Т

# $\textbf{2.2} \ p \lor q$

$$a = b \cos C + c \cos B$$
 OR  $b = c \cos A + a \cos C$ 

Truth table:

p	q	$p \lor q$
Т	T	Т

# 2.3 $\backsim p \lor q$

$$a \neq b \cos C + c \cos B$$
 OR  $b = c \cos A + a \cos C$ 

Truth table:

∽p	q	$\neg p \lor q$
F	Т	Т

# **2.4** $p \Rightarrow \neg q$

IF 
$$a = b \cos C + c \cos B$$
, THEN  $b \neq c \cos A + a \cos C$ 

Truth table:

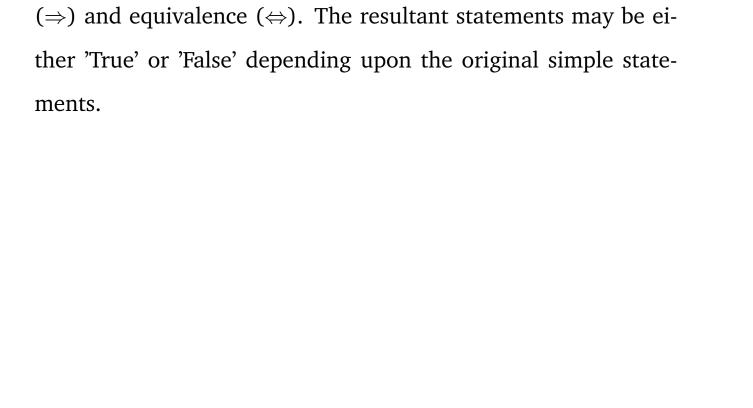
p	∽q	$p \Rightarrow \sim q$
Т	F	F

#### 3 Observation:

For any two true simple statements p and q, the compound statement true and the statement (p  $\Rightarrow$   $\backsim$ q) is found to be false.

### 4 Conclusion:

Two simple mathematical statements can be used to form a number of compound statements by using the logical connec-



tives conjuction ( $\wedge$ ), disjunction ( $\vee$ ), negation ( $\backsim$ ), implication