Content:

1 Objective :

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

2 Procedure/ Explanation :

In any triangle ABC,

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 p $\wedge$ q

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

Truth table:

p	q	p $\wedge$ q
T	T	T

2.2 $\mathbf{p} \vee \mathbf{q}$

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

Truth table:

p	q	p $\vee$ q
T	T	T

2.3 ∽p ∨ q

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

Truth table:

∽p	q	∽p ∨ q
F	T	T

2.4 p ⇒ ∽q

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

Truth table:

p	∽q	p ⇒ ∽q
T	F	F

3 Observation:

For any two true simple statements p and q, the compound statement
true and the statement (p ⇒ ∽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 connectives conjuction ($\wedge$), disjunction ($\vee$), negation ($\backsim$), implication ($\Rightarrow$) and equivalence ($\Leftrightarrow$). The resultant statements may be either 'True' or 'False' depending upon the original simple statements.

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