

# Matrix theory Assignment 5

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**Abstract**—This document explains the concept of a property regarding triangles

Download all python codes from

<https://github.com/saipranavkr/EE5609/codes>

and latex-tikz codes from

<https://github.com/saipranavkr/EE5609>

## 1 PROBLEM

Triangles on the same base(or equal bases) and between the same parallels are equal in area

## 2 SOLUTION

Consider 2 matrices,

$$\mathbf{a} = \begin{pmatrix} a_1 & a_2 & a_3 \end{pmatrix} \quad \text{and} \quad \mathbf{b} = \begin{pmatrix} b_1 & b_2 & b_3 \end{pmatrix}$$

The cross product of the 2 matrices is,

$$\mathbf{a} \times \mathbf{b} = \begin{pmatrix} i & j & k \\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{pmatrix}$$

$$\mathbf{a} \times \mathbf{b} = \begin{pmatrix} a_2b_3 - a_3b_2 & a_3b_1 - a_1b_3 & a_1b_2 - a_2b_1 \end{pmatrix} \quad (2.0.1)$$