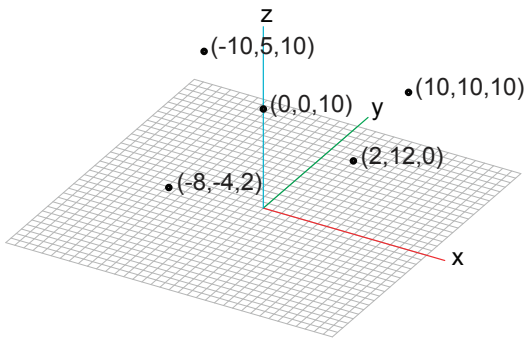
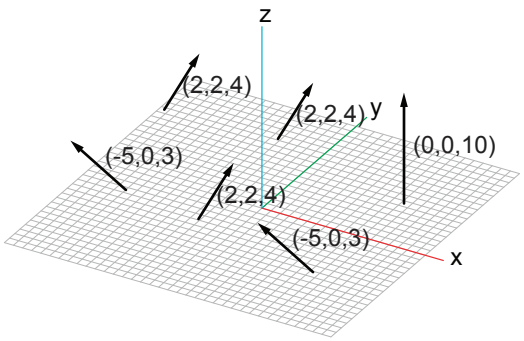
POINT AND VECTOR

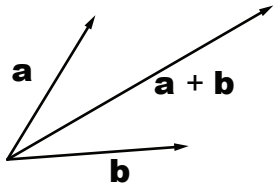
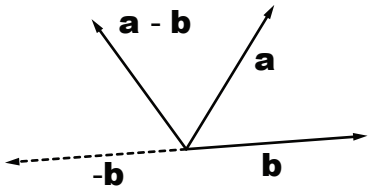
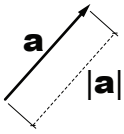
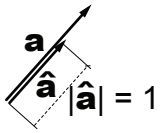
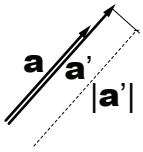
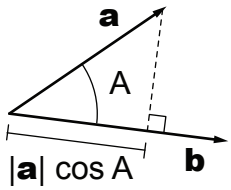
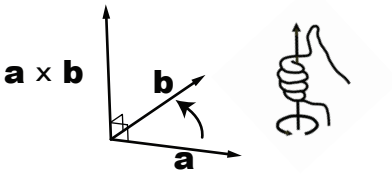


POINT **p** = (x, y, z)

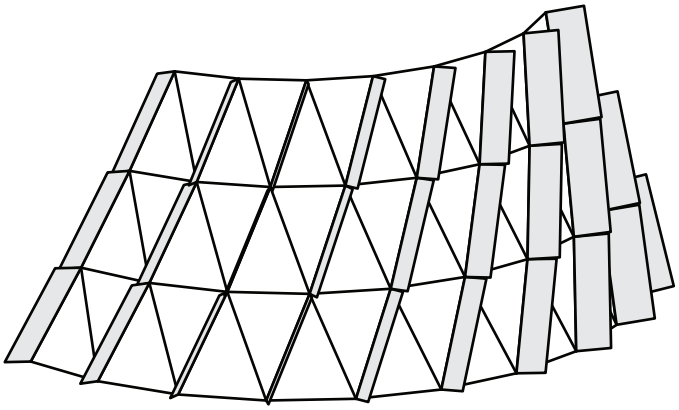


VECTOR **v** = (x, y, z)

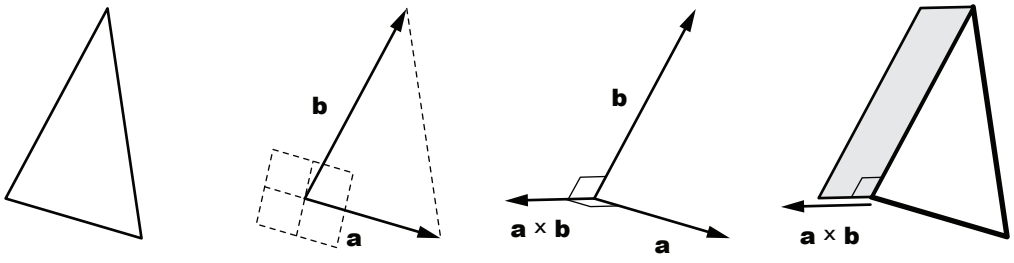
Vector Operations

Addition	**a** + **b**	**a** = (a_x, a_y, a_z) **b** = (b_x, b_y, b_z) **a** + **b** = (a_x+b_x, a_y+b_y, a_z+b_z)	
Subtraction	**a** - **b**	**a** - **b** = (a_x-b_x, a_y-b_y, a_z-b_z)	
Scaling	k**a**	k**a** = (ka_x, ka_y, ka_z)	
Length	|**a**|	|**a**| = $\sqrt{a_x^2 + a_y^2 + a_z^2}$	
Unitization	**â**	**â** = **a**/|**a**|	
Setting Length	L**â**	**a**' = **â** x L = **a**/|**a**| x L	
Dot Product	**a** ▪ **b**	**a** ▪ **b** = $a_x \times b_x + a_y \times b_y + a_z \times b_z$	
Cross Product	**a** × **b**	**a** × **b** = $\begin{pmatrix} a_y \times b_z - a_z \times b_y \\ a_z \times b_x - a_x \times b_z \\ a_x \times b_y - a_y \times b_x \end{pmatrix}$	

POINT AND VECTOR : EXERCISE



Make small diagrid and model fins perpendicular to the diagrid on any platform you choose.



Hint

In Microstation

Set ACS to the plane of the triangle which consists of one horizontal line and one diagonal line by“Rotate ACS” option with key-in of “BA” specifying 3 vertices of the triangle.

Then rotate ACS 90 degree by “Cycle Rotation” option with key-in of “BE” or “Rotate about X” with key-in of “BX” or “Rotate about Y” with key-in of “BY”.

In Rhinoceros

Set Control Plane to the plane of the triangle which consists of one horizontal line and one diagonal line by “CPlane” command choosing “3Point” option and specifying vertices of the triangle for 3 points.