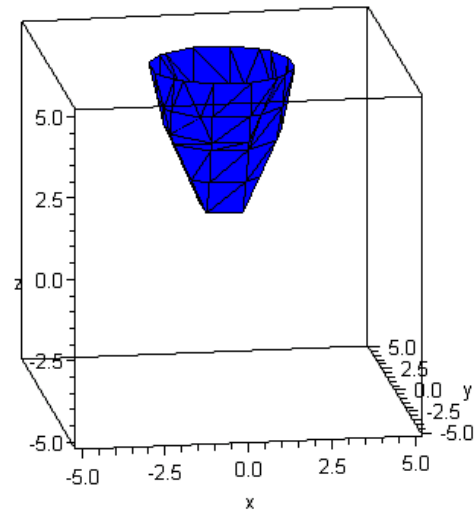


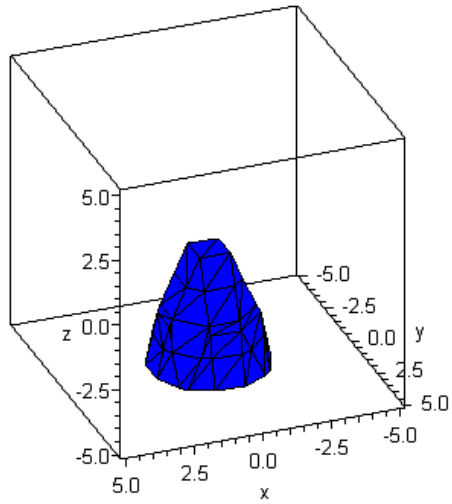
Step-1

The graph of $z = x^2 + y^2$ is a bowl opening upward as given below.



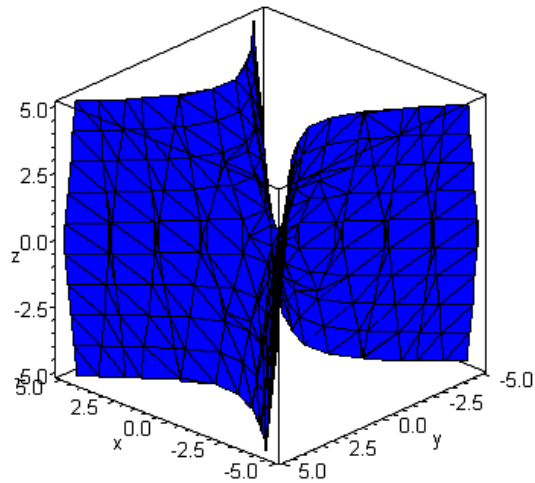
Step-2

The graph of $z = -x^2 - y^2$ is a bowl opening down ward as given below:



Step-3

The graph of $z = x^2 - y^2$ is a saddle as given below:



Step-4

$ax^2 + 2bxy + cy^2$ has a saddle point at $(0,0)$ if $ac < b^2$ and the matrix is indefinite, that is, the Eigen values of the matrix are both positive and negative.