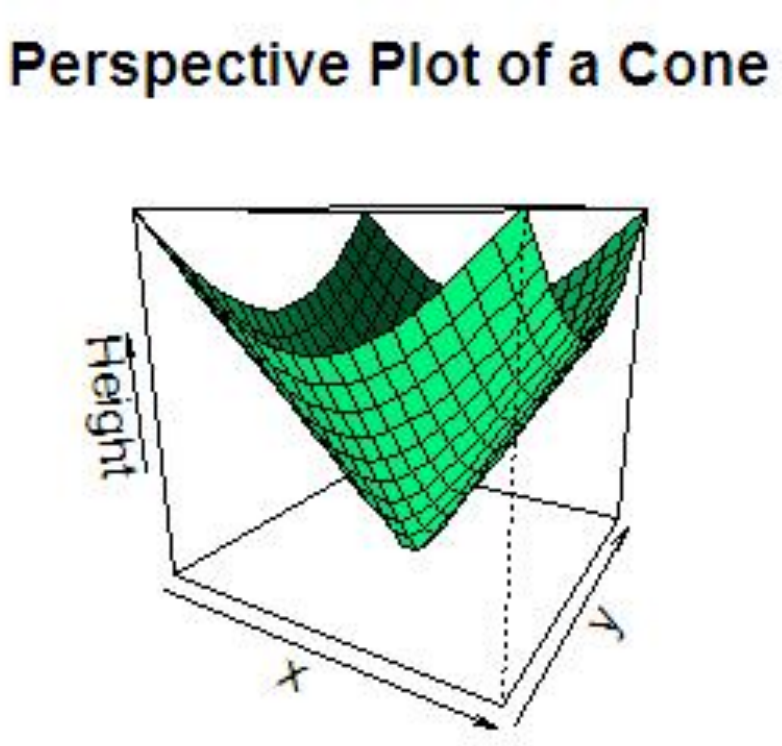

The persp() function which can be used to create 3D surfaces in perspective view.

This function mainly takes in three variables, x, y and z where x and y are vectors defining the location along x- and y-axis. The height of the surface (z-axis) will be in the matrix z. As an example,

Let's plot a cone. A simple right circular cone can be obtained with the following function.
let's prepare our variables.

```
cone <- function(x, y){
  sqrt(x^2+y^2)
}
x <- y <- seq(-1, 1, length= 20)
z <- outer(x, y, cone)
persp(x, y, z) #for simple plot without color and effect
png(file="plot of cone.png")
persp(x, y, z,
      main="Perspective Plot of a Cone",
      zlab = "Height",
      theta = 30, phi = 15,
```

```
    col = "skyblue", shade = 0.5)
dev.off()
```

We used the function seq() to generate vector of equally spaced numbers.

Then, we used the outer() function to apply the function cone at every combination of x and y.

Finally, plot the 3D surface as follows.

```
persp(x, y, z)
```

Adding Titles and Labeling Axes to Plot

We can add a title to our plot with the parameter main.

Similarly, xlab, ylab and zlab can be used to label the three axes.

Rotational angles

We can define the viewing direction using parameters theta and phi.

By default theta, azimuthal direction, is 0 and phi, colatitude direction, is 15.

Coloring and Shading Plot

Coloring of the plot is done with parameter col.

Similarly, we can add shading with the parameter shade.