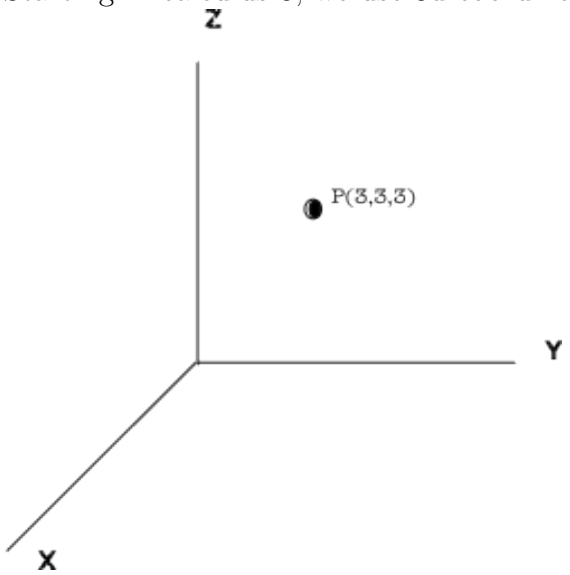
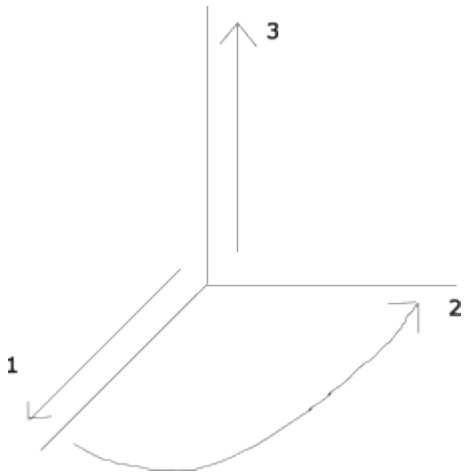
Starting in calculus 3, we use 3d coordinate system rather than 2d.

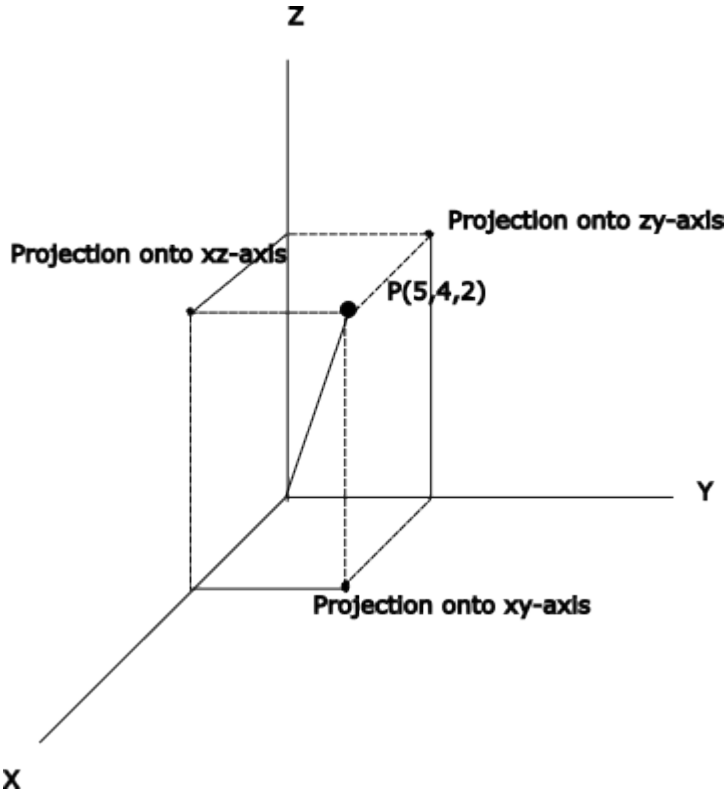



To form the graph, refer to the chart below.

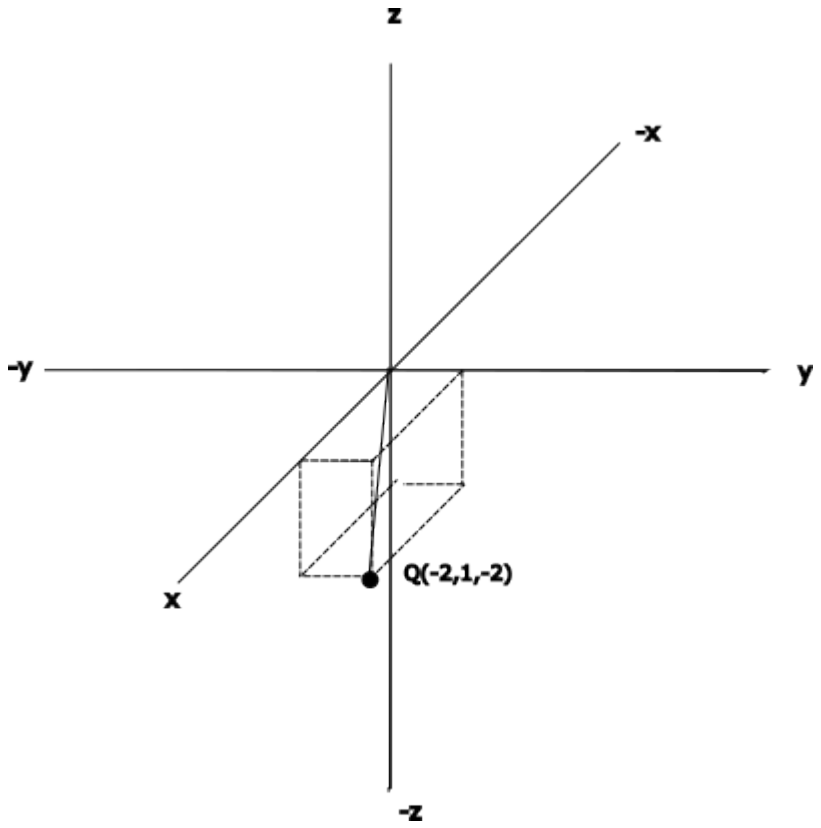
Point index to pinky finger in direction of 1; this shows the x-axis. Then curl fingers towards 2 for the y-axis. The thumb indicates the z axis.



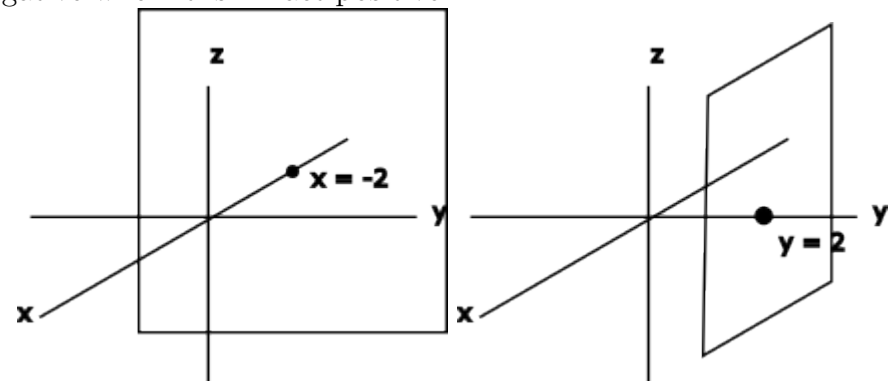

We use the **right hand rule** to get this (we use the right hand)
We can create a projection of a point onto xy, xz, yz plane by setting z, y, or x to 0.




Here the point P(5,4,2) is plotted and the projections onto the 3 planes are displayed. From left to right: (0,4,2), (5,0,2), (5,4,0)




The graph above demonstrates a point Q(2,1,-2) where the x coordinates are now negative. An error was made where the x coordinate in the graph is negative when it is in fact positive.




The preceding graphs demonstrate planes parallel to the zy and xz planes respectively. Notice for each of the graphs, there is a single fixed point and domains for unfixed coordinates are $\in R$.