Using Similar triangles Approach. we get :-

$$x' = \frac{X \cdot (\text{focal length})}{(-Z)}, \quad y' = \frac{Y \cdot (\text{focal length})}{(-Z)}$$

—(1) —(1)

∴ Here I have added -ve(Z) Co-ordinate because Z is negative on the direction of projection of points

To Calculate focal length :-

field of view or angle of view = 90°,

∴ here we have to note that 90° is the angle for the entire Screen, so we have take (θ/2) angle, i.e is 45°,

∴ By using tanθ, we can say

$$\tan(\theta) = \frac{\text{Perpendicular}}{\text{Base}} = \frac{(\text{Screensize}/2)}{\text{focal lenght}}$$

∴ $\tan 45° = 1$

so

$(\text{Screensize}/2) = \text{focal length}$.

∴ Screen size = 2

∴ So focal length = 2/2 = 1

Now, we will substitute focal length = 1 in first eq^n it will become

$$x' = \frac{x}{(-z)}, \quad y' = \frac{y}{(-z)} \text{ //}$$

Now we will use this formulae to calculate the ~~focal~~ points and perform Perspective Projection. Thank you!