Projective Transformation using homogeneous Coordinates

Mohit Madan 15D070028

Michelle Barnett 17V051006

Sachin Goyal 150020069
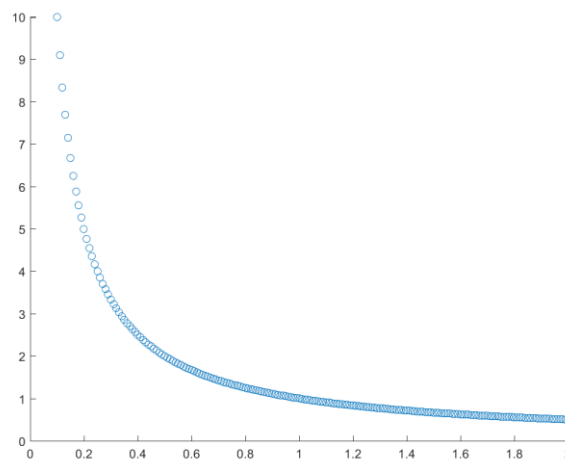
Q3) $M = \begin{matrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{matrix}$

Hyperbola can be represented as H $= [t, \frac{1}{t}, 1]^T$. We have to find the image of the hyperbola under this transformation.
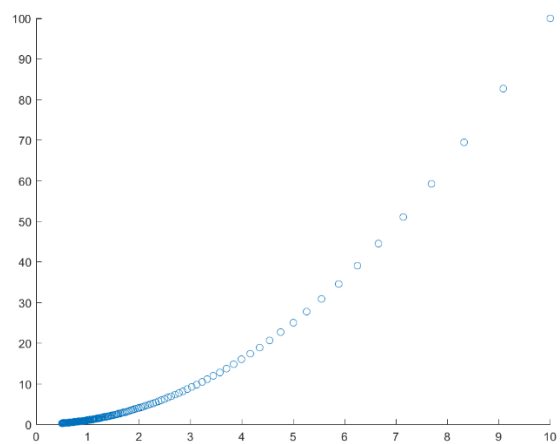
Output of transformation is M.H $= [1, \frac{1}{t}, t]^T$. This is equivalent to (on dividing by t) $= [\frac{1}{t}, \frac{1}{t^2}, 1]^T$.

Here we can say that, x = 1/t and y = 1/t². Which implies y = x²(t ≠ 0). This is the equation of parabola.

We plotted the input and out matrices in MATLAB.

Input Hyperbola

Output Parabola