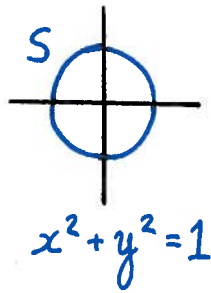


POTS

$$S \xrightarrow{T} T(S)$$

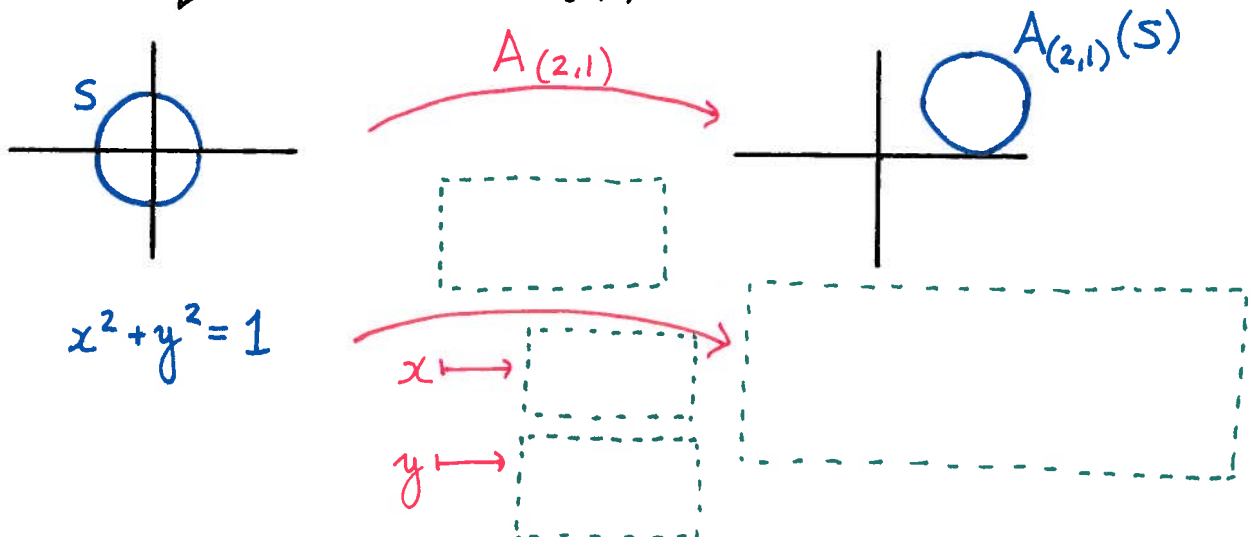
$$p(x,y) = q(x,y) \xrightarrow{T^{-1}} p \circ T^{-1}(x,y) = q \circ T^{-1}(x,y)$$

Let S below be the set of solutions of the equation $x^2 + y^2 = 1$. S is a circle.

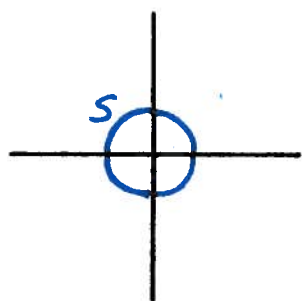


$A_{(2,1)}$ is the addition function that adds 2 to the x -coordinate and 1 to the y -coordinate. Thus, $A_{(2,1)}(S)$ is the circle S moved right 2 and up 1.

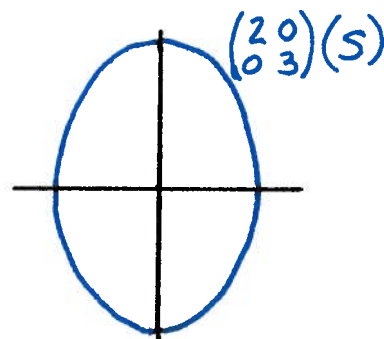
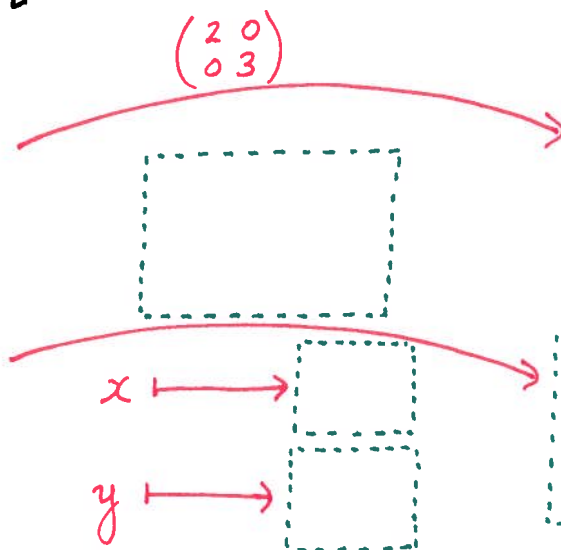
Write an equation for $A_{(2,1)}(S)$.



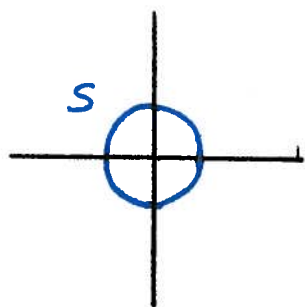
$\begin{pmatrix} 2 & 0 \\ 0 & 3 \end{pmatrix}$ is the diagonal matrix that scales the x -axis by 2 and the y -axis by 3. Thus, $\begin{pmatrix} 2 & 0 \\ 0 & 3 \end{pmatrix}(S)$ is the circle S stretched twice as wide and thrice as tall. Write an equation for $\begin{pmatrix} 2 & 0 \\ 0 & 3 \end{pmatrix}(S)$.



$$x^2 + y^2 = 1$$



$\begin{pmatrix} 2 & 3 \\ 4 & 5 \end{pmatrix}$ is a matrix. Write an equation for $\begin{pmatrix} 2 & 3 \\ 4 & 5 \end{pmatrix}(S)$.



$$x^2 + y^2 = 1$$

