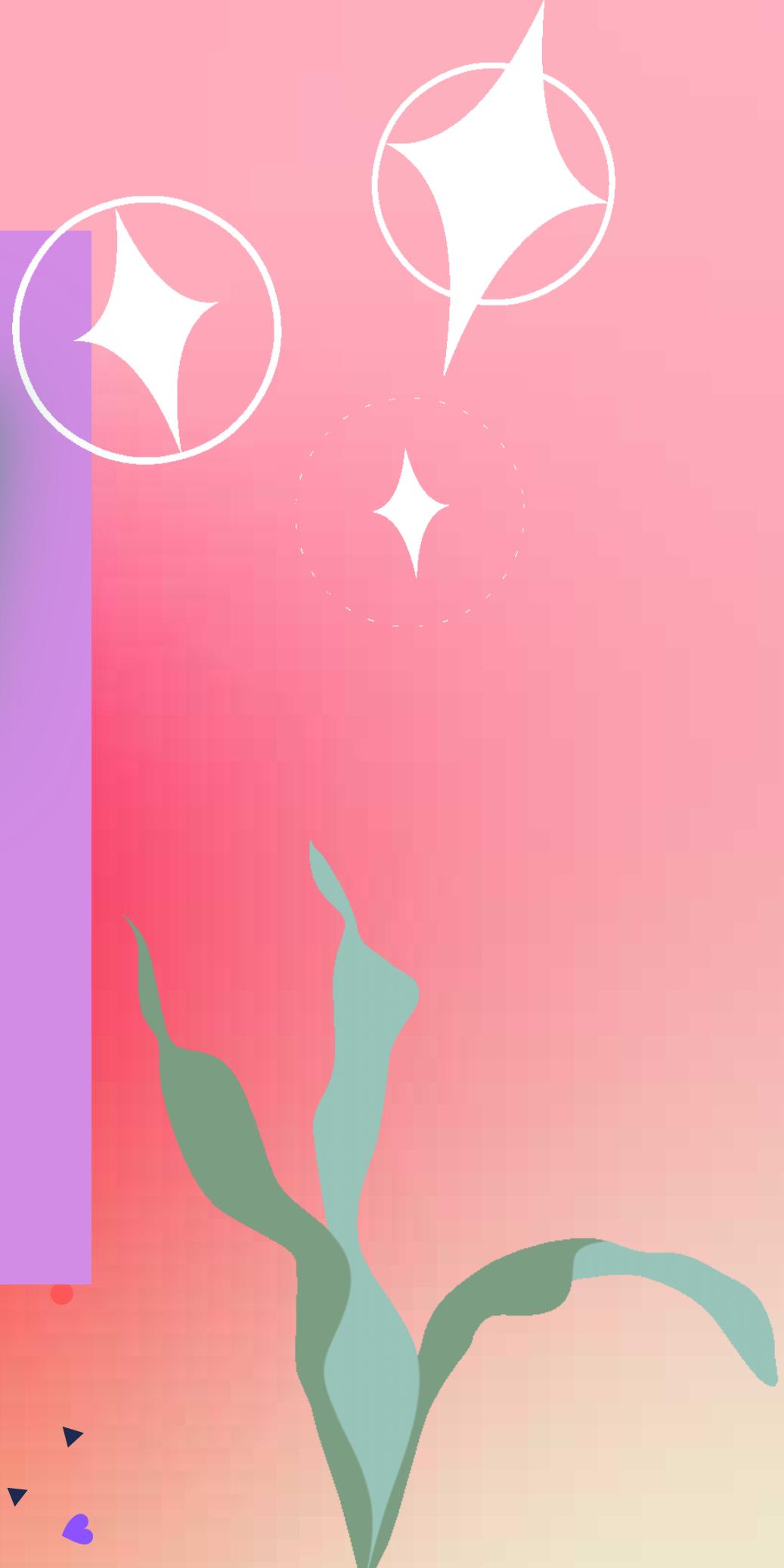




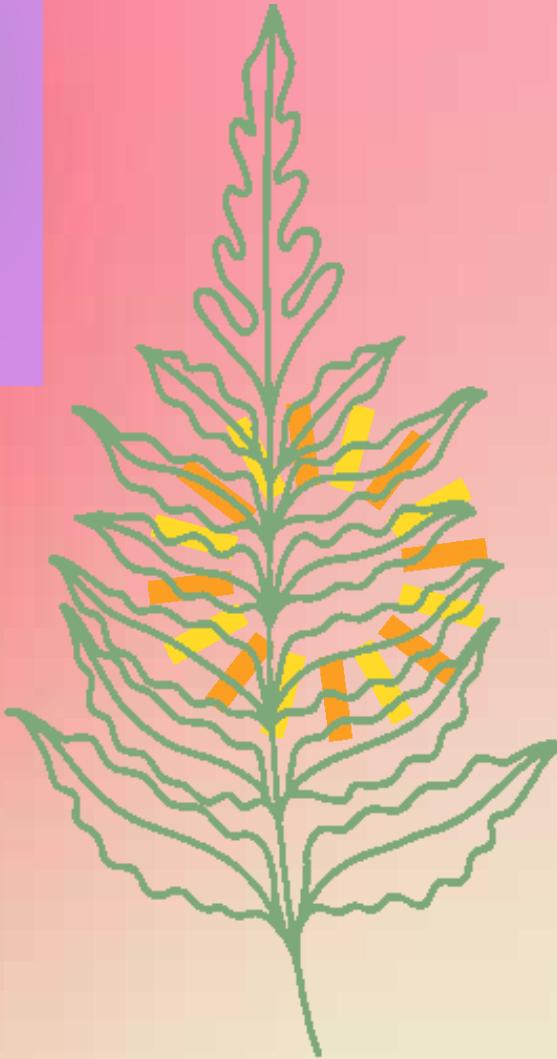
**BARNESLEY
FERN**



BARNESLEY FERN IS A
FRACTAL THAT
RESEMBLES FERN



IT TURNS OUT BARNSLEY FERN
IS CREATED USING THE
FOLLOWING TRANSFORMATION



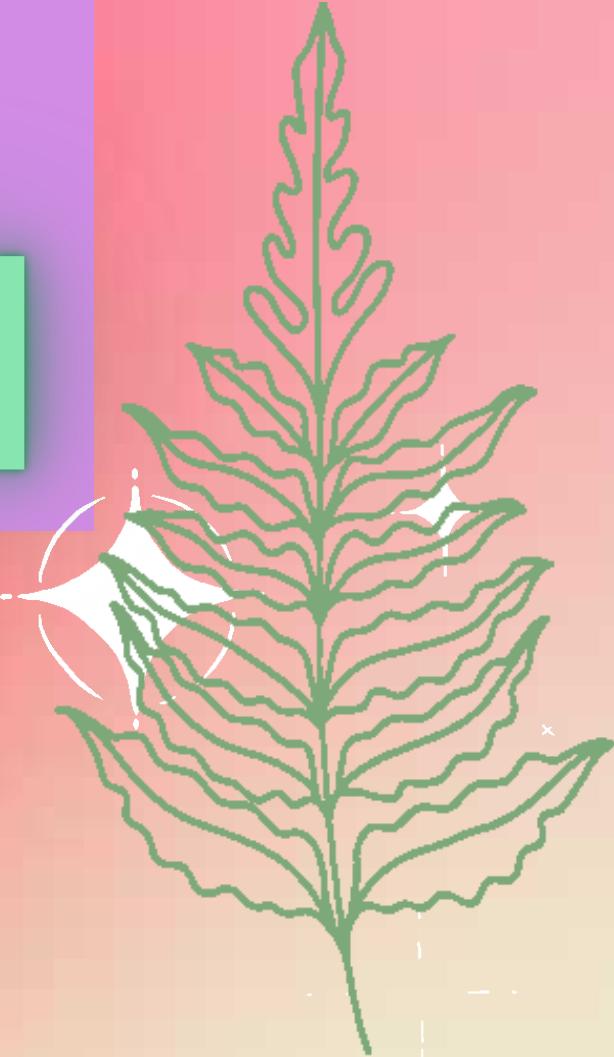
$$f_1(x, y) = \begin{bmatrix} 0 & 0 \\ 0 & 0.16 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix}$$

$$f_2(x, y) = \begin{bmatrix} 0.85 & 0.04 \\ -0.04 & 0.85 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} + \begin{bmatrix} 0 \\ 1.6 \end{bmatrix}$$

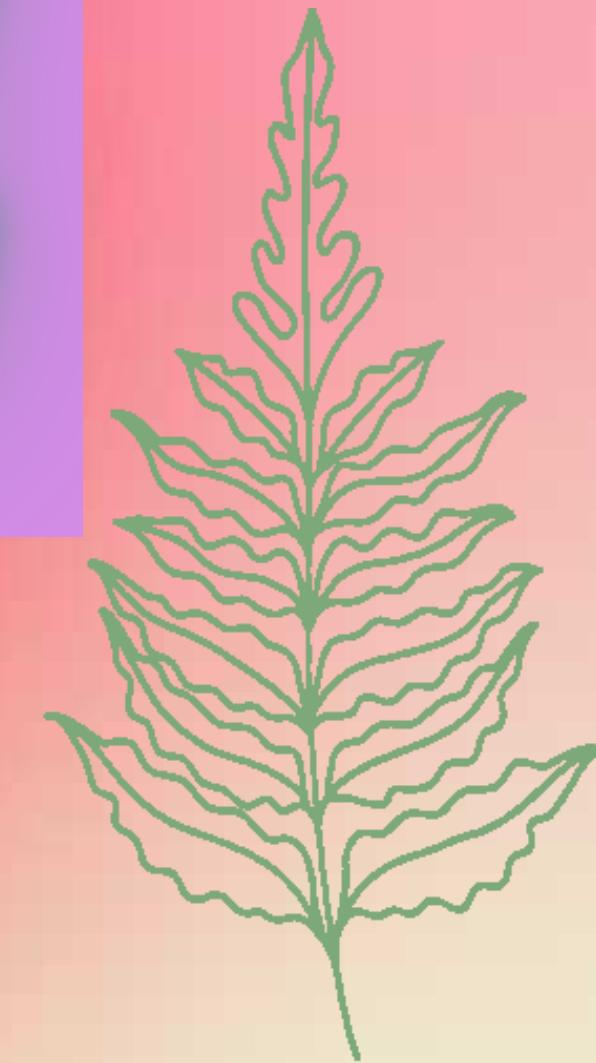
$$f_3(x, y) = \begin{bmatrix} 0.2 & -0.26 \\ 0.23 & 0.22 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} + \begin{bmatrix} 0 \\ 1.6 \end{bmatrix}$$

$$f_4(x, y) = \begin{bmatrix} -0.15 & 0.28 \\ 0.26 & 0.24 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} + \begin{bmatrix} 0 \\ 0.44 \end{bmatrix}$$

NOW THESE
TRANSFORMATIONS ARE
RANDOMLY CHOSEN WITH
CERTAIN PROBABILITY FOR EACH

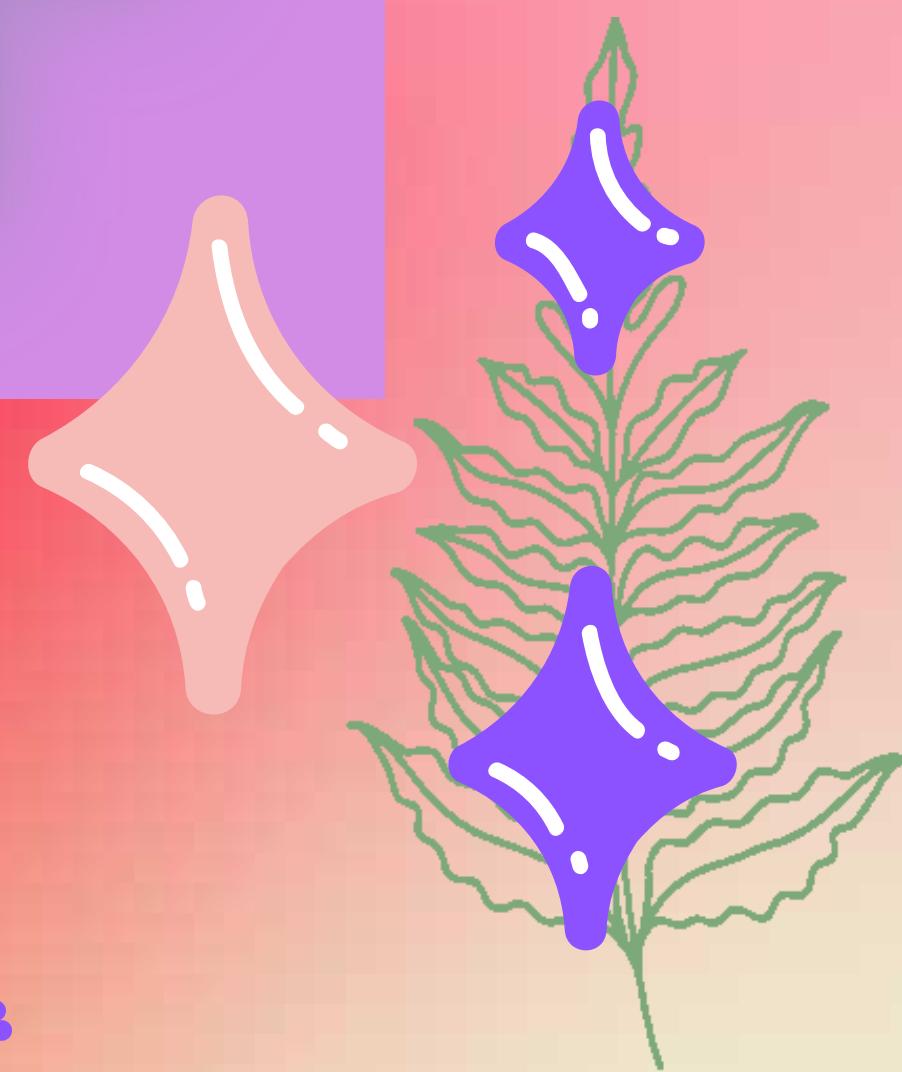


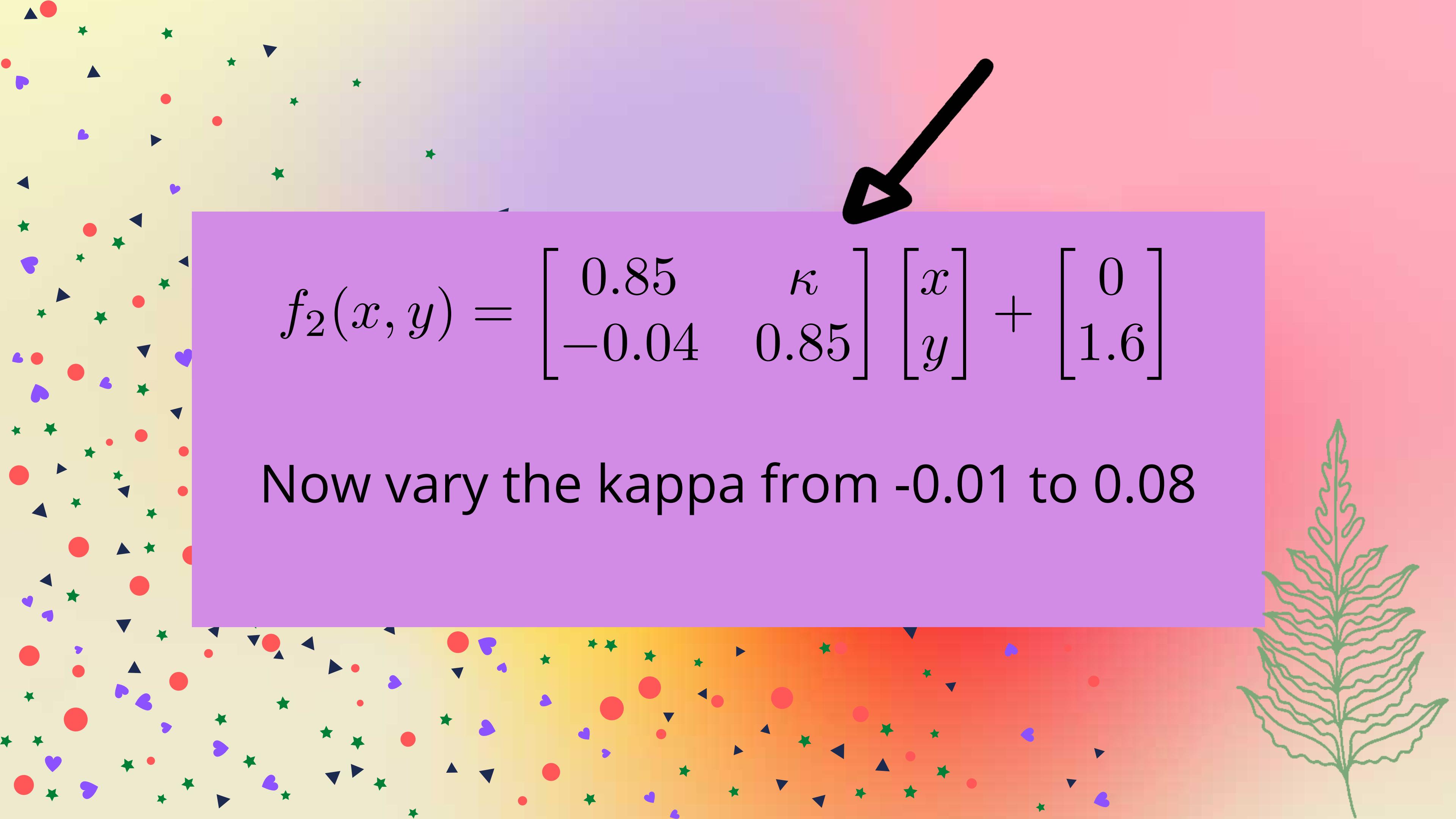
$P(\text{TRANSFORMATION 1}) = 0.01$
 $P(\text{TRANSFORMATION 2}) = 0.85$
 $P(\text{TRANSFORMATION 3}) = 0.07$
 $P(\text{TRANSFORMATION 4}) = 0.07$





SOMETHING INTERESTING
HAPPENS ON TWEAKING THE
2ND TRANSFORMATION



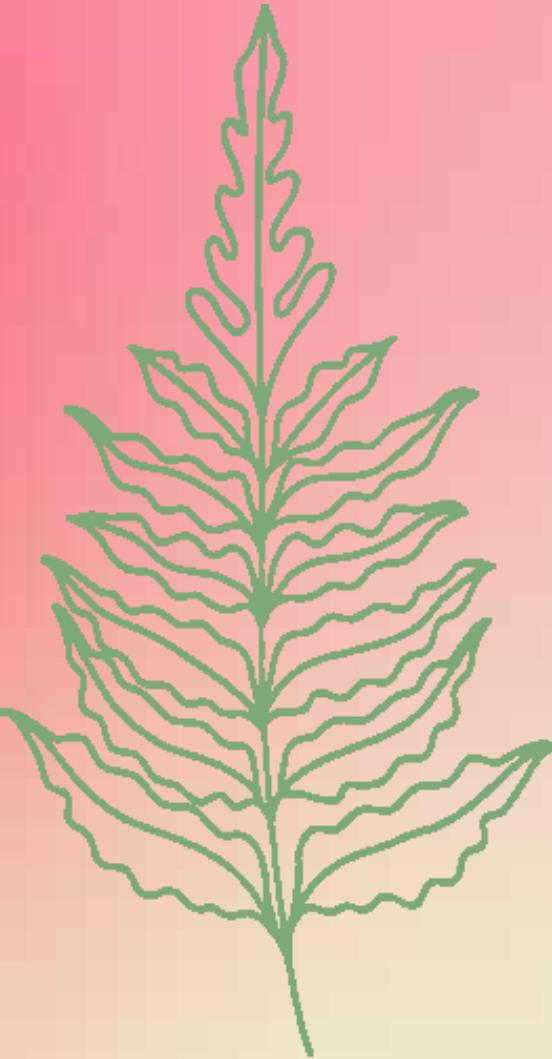

$$f_2(x, y) = \begin{bmatrix} 0.85 & \kappa \\ -0.04 & 0.85 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} + \begin{bmatrix} 0 \\ 1.6 \end{bmatrix}$$

Now vary the kappa from -0.01 to 0.08





THANK
YOU





BARNSTED FERN