```
> restart : with(LinearAlgebra) : with(plots) : with(plottools) :
> A := Matrix([[1, a], [1, 0]]) :
> J, Q := JordanForm(A, output = ['J', 'Q'])
```

$$J, Q := \left[\begin{bmatrix} \frac{1}{2} - \frac{\sqrt{1+4a}}{2} & 0 \\ 0 & \frac{1}{2} + \frac{\sqrt{1+4a}}{2} \end{bmatrix}, \begin{bmatrix} \frac{\sqrt{1+4a}-1}{2\sqrt{1+4a}} & \frac{1+\sqrt{1+4a}}{2\sqrt{1+4a}} \\ -\frac{1}{\sqrt{1+4a}} & \frac{1}{\sqrt{1+4a}} \end{bmatrix}\right] \quad (1)$$

```
> AK := Q . MatrixPower(J, k) . MatrixInverse(Q) . Vector([1, 1]) :
> dominant_vec := Vector([(sqrt(1+4*a)-1)/(2*sqrt(1+4*a)), -1/sqrt(1+4*a)]) :
> recursion := dominant_vec[1]/dominant_vec[2]
```

$$recursion := \frac{1}{2} - \frac{\sqrt{1+4a}}{2} \quad (2)$$

```
> eq := recursion = 3
```

$$eq := \frac{1}{2} - \frac{\sqrt{1+4a}}{2} = 3 \quad (3)$$

```
> # Since the result contains a complex number, we cannot solve it using
    shitty Maple
>
```