Part 2.

From part 1, we know that the parabola curve is determined by the function $D = \frac{T^2}{4}$.

We can rewrite the equation as $4 = \frac{T^2}{D}$

$$\Rightarrow 4 = \frac{(\lambda_1+\lambda_2)^2}{\lambda_1\lambda_2} \quad (\because T=\lambda_1+\lambda_2,\ D=\lambda_1\lambda_2)$$

$$= \frac{\lambda_1^2+\lambda_2^2+2\lambda_1\lambda_2}{\lambda_1\lambda_2}$$

$$= \frac{\lambda_1}{\lambda_2} + \frac{\lambda_2}{\lambda_1} + 2.$$

from the red line to the right, λ_1 and λ_2 have same signs.

We assume that $|\lambda_1| > |\lambda_2|$.

$\Rightarrow$ the convergence rate will be exponential in $\left|\frac{\lambda_2}{\lambda_1}\right|$

From the cited graph and knowledge, we know that if λ_1 and λ_2 have different signs, the position of (D,T) of that matrix will be on the saddle part.

From the graph what we plot, the red color is almost a verticle line.
In this case, $D=\lambda_1\lambda_2 \approx 0$, which means λ_2 has a very small value. then $T=\lambda_1+\lambda_2 \approx \lambda_1$ which means $(0,\lambda_1)$ is almost the position of these kind of iteration. In our case, the red color represents iterations from 1 to 5. It also verified that if $|\lambda_2|/|\lambda_1|$ is small, the power method will converge quickly.

If $|\lambda_2|/|\lambda_1|$ is closed to 1, then the power method will converge slowly and need more iteration to succeed. and also the position of (D,T) is will be more close to the curve $D=\frac{T^2}{4}$.

If $\lambda_1+\lambda_2=0$, then the position will be on the axis of determinant.