For any 2-by-2 matrix , the determinant equals while the trace equals . The power method can be used on to obtain the dominant eigenvalue , as well as on , whose dominant eigenvalue is , in order to determine . The trace also equals the sum of the diagonal elements of , which is constrained under the range . This matches what is shown on the -axis of the graph of . In addition, the determinant has an upper boundary of for real eigenvalues. This can be seen by first taking a representation of the characteristic polynomial for . Following Vieta’s formulas, (the negative of the trace), and . For real ,

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The determinant and the trace are related by an inequality with the boundary occurring where the determinant is at a maximum with respect to the trace. Let represent the determinant and represent the trace. Since ,

and

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Setting this derivative equal to zero yields as a maximum (since the second derivative equals ). Therefore, and . Eliminating the parameter yields , which explains the presence of a horizontal parabola-shaped boundary in the plotted data. Then the points all fall in the region .

For , the eigenvalues are the reciprocals of those of , so the expressions for the trace and determinant are and . The trace of also equals since , and the determinant of also equals . Since and could potentially be very small, the graph of has a much larger domain and range than the graph of . However, the constraints on and do influence the graph of as it approaches the origin.

In addition, the number of iterations needed to determine the dominant eigenvalue of is related to its position on the plot. More specifically, the ratio is inversely proportional to the “speed” of convergence of the power method, or directly proportional to the number of iterations required. As determined from earlier, the determinant is maximized for a given trace when . The larger is relative to , the smaller their product , which is the determinant. On the graph, this means that the farther left a point is for a given -value, then the more iterations is required for the convergence of the power method on that matrix.