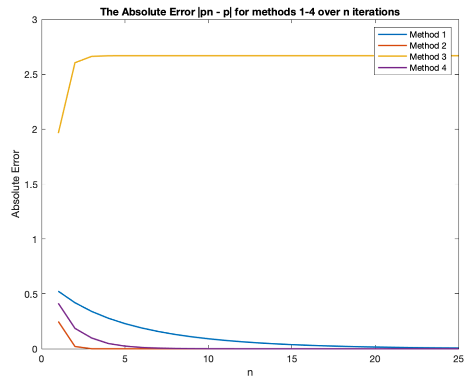
Part A

1. Method 2
2. Method 4
3. Method 3
4. Method 1



	1	2	3	4
1	0.5237	0.2483	1.9625	0.4138
2	0.4191	0.0205	2.6046	0.1856
3	0.3399	1.5639e-...	2.6623	0.0979
4	0.2780	9.1647e-...	2.6678	0.0477
5	0.2288	0	2.6683	0.0242
6	0.1892	0	2.6684	0.0120

Part B

Methods 1, 2, and 4 are set up as fixed-point problems: they search for where $g(x) = x$. The fewer iterations required for their absolute errors to equal 0, the faster the convergence. So we see from the graph that method 2 converges fastest, then method 4, then method 1.
Method 3 is a root-finding problem of the form $f(x) = g(x) - x = 0$ where $g(x) = x$. Since $p_n = 0$, $|p_n - p| = |0 - p| = p$. Once the absolute error for method 3 converges to a value, the solution has been found. Here it has found the root to 5 significant digits after the 6^{th} iteration from the table of absolute error values. Similarly, method 2 converged to a solution by the 5^{th} iteration.

Part C

Asymptotic error constants were computed using elementwise division and power operations. p_n and p_{n+1} are the extraction of all columns and the $2^{nd} : n^{th}$ rows and $1^{st} : n-1^{th}$ rows of the absolute error matrix, respectively. λ's for $n = 2 : n-1$ were computed.

- Method 1: For $n \geq 192$, $\alpha = 1$, $\frac{|p_{n+1}-p|}{|p_n-p|^{\alpha}} = 1$. So, this sequence converges to p of order 1 with asymptotic error constant $\lambda = 1$.
- Method 2: For $n \geq 5$, $\alpha = 1$, $\frac{|p_{n+1}-p|}{|p_n-p|^{\alpha}} = \frac{0}{0}$, which is undefined.
- Method 3: For $n \geq 17$, $\alpha = 2$, $\frac{|p_{n+1}-p|}{|p_n-p|^{\alpha}} = 0.374756176784315$. So, this sequence converges to p of order 2 with asymptotic error constant $\lambda = 0.374756176784315$, and this sequence is said to be quadratically convergent.
- Method 4: For $n \geq 52$, $\alpha = 1$, $\frac{|p_{n+1}-p|}{|p_n-p|^{\alpha}} = \frac{0}{0}$, which is undefined.