Problem 1

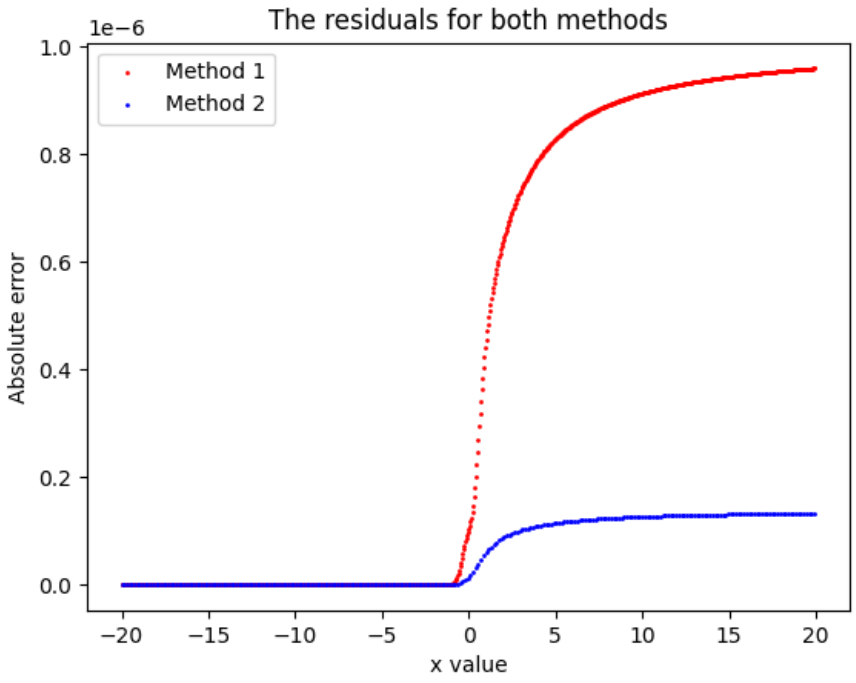
a) How many function evaluations per step

The first method (rk4_step) called 4 function evaluations per step.

The second method (rk4_stepd) called 12 function evaluations per step.

b) Comparing both methods

Considering the answer in a), this implies that h for the first method must be a third of that of the second method, to achieve the same total number of function evaluations. ($h_d = 3h$) **The second method is more accurate.** To illustrate, below is a residuals plot.



To be exact, the first method evaluates the function 3196 times, while the second method evaluates the function 3192 times. Which is almost the same (although method 2 is at a slight disadvantage) and we still see that method 2 is much more accurate.