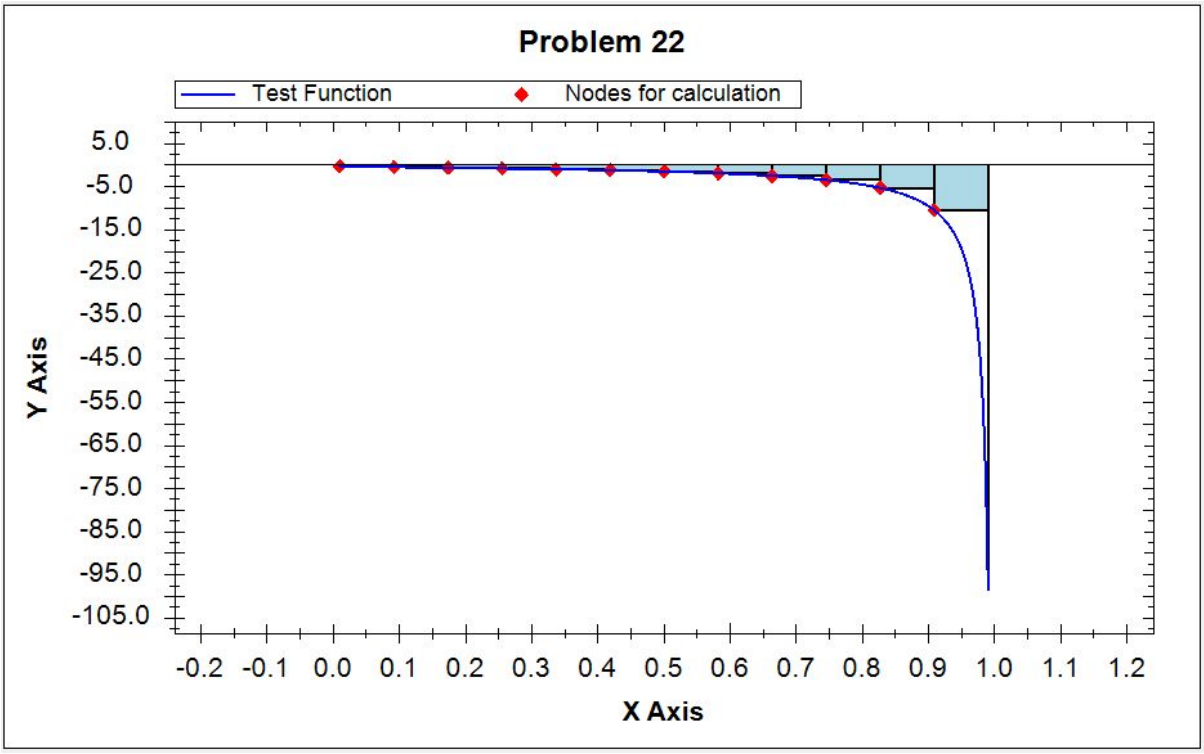
The below table shows the calculated value of the integral in problem 22 for different numbers of nodes and the different methods used in this project.

Problem 22

Number of Nodes	Approximate Value of Integral						
	Rectangle	Rectangle V1 (Theta)		Rectangle V2 (Theta)		Trapezia	Simpson's Rule
		0.25	0.75	0.25	0.75		
3	-0.81	-1.28	-3.95	-12.98	-37.30	-25.14	-9.73
5	-1.42	-1.87	-4.41	-7.50	-19.66	-13.58	-6.27
9	-2.02	-2.44	-4.47	-5.06	-11.14	-8.10	-4.79
17	-2.58	-2.96	-4.68	-4.10	-7.14	-5.62	-4.24
33	-3.06	-3.38	-4.54	-3.82	-5.34	-4.58	-4.07
65	-3.44	-3.67	-4.35	-3.82	-4.58	-4.20	-4.04
129	-3.70	-3.84	-4.21	-3.89	-4.27	-4.08	-4.03

One interesting occurence is this case is that for rectangles of V2, Trapezia, and Simpson's Rule, the values start large and negative and then become smaller as the all approach a value of about -4. The normal rectangles and rectangles of V1 with theta 0.25 start small and negative and approach -4 from the other direction. Rectangles of V1 for theta 0.75 start small, increase in magnitude and then decrease again as they approach -4.

The behavior of the normal rectangles can be explained by showing the following graph. Because of the shape of this graph, the normal rectangle's sum is always smaller than the value of the integral, but as the number of rectangles increases, this error becomes smaller and the value approaches -4. For rectangles of V1 with theta 0.25 the behavior is very similar, theta of 0.25 means a shift of 0.25 of the interval towards the next interval and this shift is too small to make a difference is these measurements. Below see normal rectangles.



The behavior of the rectangles of variant one with theta 0.75 can be explained by the fact that the slope is >1 for the last part of the function, which also makes up most of the value of it. Theta of 0.75 means that the node is shifted by 0.75 of the interval length towards the next interval. From a