Examining the calculated values and comparing them to the Lagrange Interpolation values shows only minor differences for most of the points where *x < 0.850*. It is when we get to values for *x > 0.850* that we start to see the difference in y –values creep up as seen in Table 2.

Whereas differences in the y-values for values of *x < 0.855* remained below 1E-5, by the time we get to *x > 0.850* that difference has now grown and reaches a high of *9.7E-02*. As described above, these differences between the calculated y-values and the interpolated values can be attributed to the spacing between nodes.

X Value |Calculated f(x) |Interpolated f(x) |Difference

|  |  |  |  |
| --- | --- | --- | --- |
| 0.855 | 0.35421582 | 0.34353372 | 0.0106821 |
| 0.86 | 0.346880911 | 0.332944149 | 0.013936762 |
| 0.865 | 0.338894401 | 0.321396247 | 0.017498154 |
| 0.87 | 0.330287539 | 0.308922461 | 0.021365078 |
| 0.875 | 0.321092379 | 0.295560452 | 0.025531928 |
| 0.88 | 0.311341694 | 0.281353706 | 0.029987988 |
| 0.885 | 0.301068882 | 0.266352203 | 0.034716679 |
| 0.89 | 0.290307881 | 0.250613157 | 0.039694724 |
| 0.895 | 0.279093078 | 0.23420183 | 0.044891247 |
| 0.9 | 0.267459219 | 0.217192425 | 0.050266794 |
| 0.905 | 0.255441329 | 0.199669061 | 0.055772268 |
| 0.91 | 0.243074619 | 0.181726835 | 0.061347784 |
| 0.915 | 0.230394403 | 0.163472978 | 0.066921426 |
| 0.92 | 0.217436019 | 0.145028108 | 0.072407911 |
| 0.925 | 0.204234742 | 0.126527591 | 0.077707151 |
| 0.93 | 0.190825706 | 1.08E-01 | 0.082702704 |
| 0.935 | 0.17724383 | 0.089983711 | 0.087260119 |
| 0.94 | 0.163523735 | 0.072298583 | 0.091225152 |
| 0.945 | 0.149699674 | 0.055277807 | 0.094421867 |
| 0.95 | 0.135805464 | 0.039154864 | 0.096650601 |
| 0.955 | 0.121874411 | 0.024188624 | 0.097685787 |
| 0.96 | 0.107939245 | 0.0106656 | 0.097273644 |
| 0.965 | 0.094032059 | -0.001097646 | 0.095129705 |
| 0.97 | 0.080184248 | -0.010751942 | 0.09093619 |
| 0.975 | 0.066426445 | -0.01791277 | 0.084339215 |
| 0.98 | 0.052788472 | -0.022157354 | 0.074945826 |
| 0.985 | 0.039299286 | -0.023021567 | 0.062320852 |
| 0.99 | 0.025986926 | -0.019996642 | 0.045983568 |
| 0.995 | 0.012878473 | -0.012525691 | 0.025404164 |
| 1 | 9.94E-17 | 9.94E-17 | 0 |

Table 2. Calculated values and Lagrange Interpolation values.

Hermite interpolation does a much better job at approximating the y-values than Lagrange interpolation. As we can see by examining the calculated y-values versus the interpolated values in Table 3, the difference between these values is minuscule. For values of *x < 0.91 ,* the difference is as small as *1E-17*. It is only once we get to *x > 0.91* that the difference climbs to as high as *1.09E-08*, which is still a very small difference. The difference for the error can be attributed to the spacing between nodes as previously discussed.

X Value|Calculated f(x)|Interpolated f(x)|Difference

|  |  |  |  |
| --- | --- | --- | --- |
| 0.91 | 0.243074619 | 0.243074628 | 9.73E-09 |
| 0.915 | 0.230394403 | 0.230394415 | 1.18E-08 |
| 0.92 | 0.217436019 | 0.217436033 | 1.39E-08 |
| 0.925 | 0.204234742 | 0.204234758 | 1.61E-08 |
| 0.93 | 0.190825706 | 0.190825724 | 1.78E-08 |
| 0.935 | 0.17724383 | 0.17724385 | 2.03E-08 |
| 0.94 | 0.163523735 | 0.163523757 | 2.23E-08 |
| 0.945 | 0.149699674 | 0.149699698 | 2.33E-08 |
| 0.95 | 0.135805464 | 0.13580549 | 2.53E-08 |
| 0.955 | 0.121874411 | 0.121874436 | 2.52E-08 |
| 0.96 | 0.107939245 | 0.10793927 | 2.54E-08 |
| 0.965 | 0.094032059 | 0.094032084 | 2.44E-08 |
| 0.97 | 0.080184248 | 0.08018427 | 2.18E-08 |
| 0.975 | 0.066426445 | 0.066426464 | 1.90E-08 |
| 0.98 | 0.052788472 | 0.052788487 | 1.51E-08 |
| 0.985 | 0.039299286 | 0.039299297 | 1.09E-08 |
| 0.99 | 0.025986926 | 0.025986932 | 5.70E-09 |
| 0.995 | 0.012878473 | 0.012878474 | 1.69E-09 |
| 1 | 9.94E-17 | 9.94E-17 | 0 |

Table 3. Calculated values and Hermite Interpolation values