From Simpson's 1/3 rule, we have

$$\int_0^1 \frac{\log(1+x^2)}{1+x^2}\,dx = h/3\,[(y_0 + y_{10}) + 4(y_1 + y_3 + y_5 + y_7 + y_9) + 2(y_2 + y_4 + y_6 + y_8)]$$

$$= \frac{0.1}{3}\,[(0.3278) + 4(0.0098 + 0.0790 + 0.1785 + 0.$$

$$+ 0.3016) + 2(0.0377 + 0.1279 + 0.2260 + 0.2$$

$$= 0.173$$

## 4.7 WEDDLE'S RULE ($n = 6$)

Substituting $n = 6$ in the Newton's Cot's formula, we have

$$\int_{x_0}^{x_0+6h} f(x)\,dx = h\left[6y_0 + 18\Delta y_0 + 27\Delta^2 y_0 + 24\Delta^3 y_0 + \frac{123}{10}\Delta^4 y_0 + \frac{33}{10}\Delta^5 y_0 + \frac{41}{140}\Delta^6 y_0\right]$$

*Then if we write in terms of* $y_i$,

$$\int_{x_0}^{x_0+6h} f(x)\,dx = \frac{3h}{10}\left[y_0 + 5y_1 + y_2 + 6y_3 + y_4 + 5y_5 + y_6\right]$$

*Similarly, for the interval* $x_6$ *to* $x_{12}$ *we have*

$$\int_{x_6}^{x_0+12h} f(x)\,dx = \frac{3h}{10}\left[y_6 + 5y_7 + y_8 + 6y_9 + y_{10} + 5y_{11} + y_{12}\right]$$

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*Finally for* $x_{n-6}$ to $x_n$ we have

$$\int_{x_{n-6}}^{x_n} f(x)\,dx = \frac{3h}{10}\left[y_{n-6} + 5y_{n-5} + y_{n-4} + 6y_{n-3} + y_{n-2} + 5y_{n-1} + y_n\right]$$