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Phys 3766

(1) Let bounds be $x_1 = a$, x_2 b.

~~to Isaac~~ require even number of steps N_1,

$h_1 = \frac{(b-a)}{N_1}$. Now ~~double~~ Quadruple the N_1 (Also close in Trapezoida rule but for 2).

I_0 (True integral) = I_1 (our integral) $+ c h_1^2$

$I = I_2 + c h_2^2$

The difference between the two I_s will give us the error in this method.

$I - I = I_2 - I_1 + c h_2^2 - c h_1^2 = 0$

$(I_2 - I_1) = c h_1^2 - c h_2^2$

$= c(4h_2)^2 - c(2h_2)^2$

$= 16 c h_2^2 - c h_2^2$

$I_2 - I_1 = 15 c h_2^2$ $\quad (c h_2 = e)$

$$\boxed{e = \frac{1}{15}(I_2 - I_1)}$$