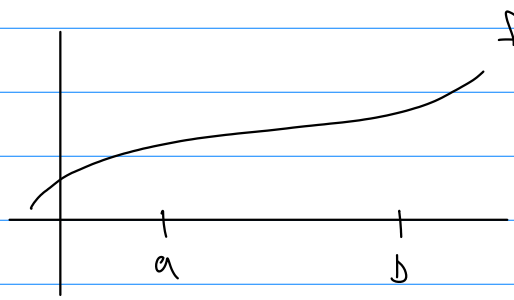
Left / Right Point Approximation



Set $x_1 =$ $w_1 =$

$\Rightarrow \int_a^b f(x)dx =$ $=$ $\leftarrow$

Look at the order of accuracy.

Assume $x \in$. Insert Taylor Series into integral:

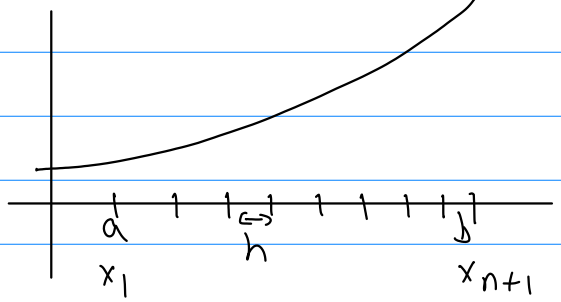
$\int_0^h ($ $)dx =$

The Approximation is $\int_0^h f(x)\,dx \approx$

Error: $e = ($ $) - ($ $)$

$=$ $=$ $\in$

Now look integrating $\int_a^b f(x)\,dx$. Break up $[a,b]$ into equal parts & use the left point on each part:



$\int_a^b f(x)\,dx \approx$

Called a or

Each sub-interval has an error of .

Total error is the :

$E =$

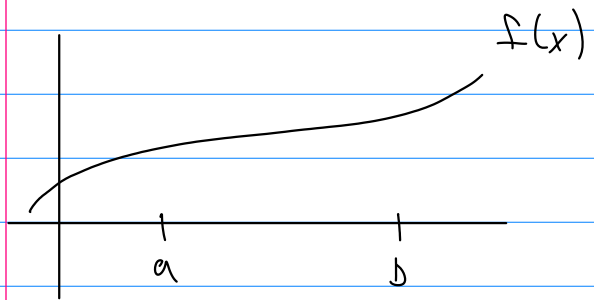
relationship between n & h:

=> Overall ((total)) error = =

ex) $\int_0^1 x^2 \, dx =$

n	h	E	ratio: $E(n)/E(0.5n)$
2	0.5		
4	0.25		
8	0.125		
16	0.0625		

Right - point Approximation:



Same error as left-point rule.

$x_1 =$ $w_1 =$