Numerical Methods – Q7: Integration [Practice/E]

(12/6/21)

Using the S_n given, complete the following table of ratios of differences (where S is the exact value of $\frac{2}{3}$).

n	S_n	$S_n - S_{\frac{n}{2}}$	Ratios	$S_n - S$	Ratios
1					
2	0.638071				
4	0.656527				
8	0.663079				

Solution

n	S_n	$S_n - S_{\frac{n}{2}}$	Ratios	$S_n - S$	Ratios
1					
2	0.638071			-0.028596	
4	0.656527	0.018456		-0.010140	0.354595
8	0.663079	0.006552	0.355007	-0.003588	0.353846

[The values of k that are actually realised for the integration methods are often significantly different from the theoretical ones, and can be higher or lower.]