

## Exercício de Programação 4: Integração Numérica via Newton-Cotes

### 1) Integrações Numéricas

a) 
$$\int_2^5 \frac{1}{x(x)} dx$$

i) Regra do Trapézio

```
raphael@raphael-ubuntu:~/Downloads/AlgNum/ExerciciosPraticos/Ex04$ octave principal.m
QSocketNotifier: Can only be used with threads started with QThread
Integral = 0.8595
Info = 0
raphael@raphael-ubuntu:~/Downloads/AlgNum/ExerciciosPraticos/Ex04$ octave principal.m
```

ii) Regra do 1/3 de Simpson

```
raphael@raphael-ubuntu:~/Downloads/AlgNum/ExerciciosPraticos/Ex04$ octave principal.m
QSocketNotifier: Can only be used with threads started with QThread
Integral = 0.8438
Info = 0
raphael@raphael-ubuntu:~/Downloads/AlgNum/ExerciciosPraticos/Ex04$ octave principal.m
```

iii) Regra dos 3/8 de Simpson

```
raphael@raphael-ubuntu:~/Downloads/AlgNum/ExerciciosPraticos/Ex04$ octave principal.m
QSocketNotifier: Can only be used with threads started with QThread
Integral = 0.8448
Info = 0
raphael@raphael-ubuntu:~/Downloads/AlgNum/ExerciciosPraticos/Ex04$
```

b) 
$$\int_0^{\pi} \frac{x}{e^{x-1}} dx$$

i) Regra do Trapézio

```
raphael@raphael-ubuntu:~/Downloads/AlgNum/ExerciciosPraticos/Ex04$ octave principal.m
QSocketNotifier: Can only be used with threads started with QThread
Integral = 1.4017
Info = 0
raphael@raphael-ubuntu:~/Downloads/AlgNum/ExerciciosPraticos/Ex04$ octave principal.m
```

ii) Regra do 1/3 de Simpson

```
raphael@raphael-ubuntu:~/Downloads/AlgNum/ExerciciosPraticos/Ex04$ octave principal.m
QSocketNotifier: Can only be used with threads started with QThread
Integral = 1.4177
Info = 0
raphael@raphael-ubuntu:~/Downloads/AlgNum/ExerciciosPraticos/Ex04$ octave principal.m
```

iii) Regra dos 3/8 de Simpson

```

raphael@raphael-ubuntu:~/Downloads/AlgNum/ExerciciosPraticos/Ex04$ octave principal.m
QSocketNotifier: Can only be used with threads started with QThread
Integral = 1.4175
Info = 0
raphael@raphael-ubuntu:~/Downloads/AlgNum/ExerciciosPraticos/Ex04$

```

## 2) Comparação dos Resultados com o Valor Exato

$n$	$\int_2^5 \frac{1}{x(x)} dx$		$\int_0^{\pi} \frac{x}{e^{x-1}} dx$	
	$I_n$	$ 0,84240 - I_n $	$I_n$	$ 1,41787 - I_n $
1	<b>0.8595</b>	<b>0.0171</b>	<b>1.4017</b>	<b>0.01617</b>
2	<b>0.8438</b>	<b>0.0014</b>	<b>1.4177</b>	<b>0.00017</b>
3	<b>0.8448</b>	<b>0.0024</b>	<b>1.4175</b>	<b>0.00037</b>