

```
In[42]= ClearAll[n, c, y, m];
```

$$\text{lam}[n_]:=n^2\pi^2\left(\frac{3}{7\pi^3}\right)^2;$$

$$y[n_ , x_]:= \frac{c}{x+\pi} \text{Sin}\left[\sqrt{\text{lam}[n]}\left(\frac{(x+\pi)^3}{3}-\frac{\pi^3}{3}\right)\right];$$

```
data = Table[{m, r = c /. Last@Solve[ $\int_0^\pi (y[m, x])^2 (x+\pi)^4 dx = 1, c]$ ; r, N@r}], {m, 1, 6}];
```

```
Grid[Join[{{"n", "c(n)", "numerical c(n)"}}, data], Frame -> All]
```

n	c(n)	numerical c(n)
1	$\frac{\sqrt{6}}{\pi^{3/2}}$	0.16627
2	$\frac{\sqrt{6}}{\pi^{3/2}}$	0.16627
3	$\frac{\sqrt{6}}{\pi^{3/2}}$	0.16627
4	$\frac{\sqrt{6}}{\pi^{3/2}}$	0.16627
5	$\frac{\sqrt{6}}{\pi^{3/2}}$	0.16627
6	$\frac{\sqrt{6}}{\pi^{3/2}}$	0.16627

```
Out[46]=
```