```
Integrate[x^2 Cos[n x], x]
```

$$\frac{2\,x\,\text{Cos}[n\,x]}{n^2}+\frac{\left(-2+n^2\,x^2\right)\,\text{Sin}[n\,x]}{n^3}$$

```
Zeta[2]
```

$$\frac{\pi^2}{6}$$

```
FourierSeries[x^2, x, 3] // FullSimplify
```

$$\frac{\pi^2}{3}-4\,\text{Cos}[x]+\text{Cos}[2\,x]-\frac{4}{9}\,\text{Cos}[3\,x]$$

```
Sum[(-1)^n / (4 n^2 - 1), {n, 1, ∞}]
```

$$\frac{2-\pi}{4}$$

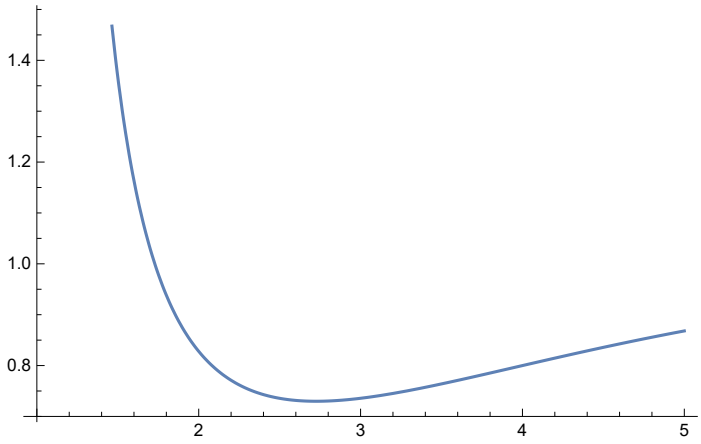
```
Zeta[2] / 4 // N
```

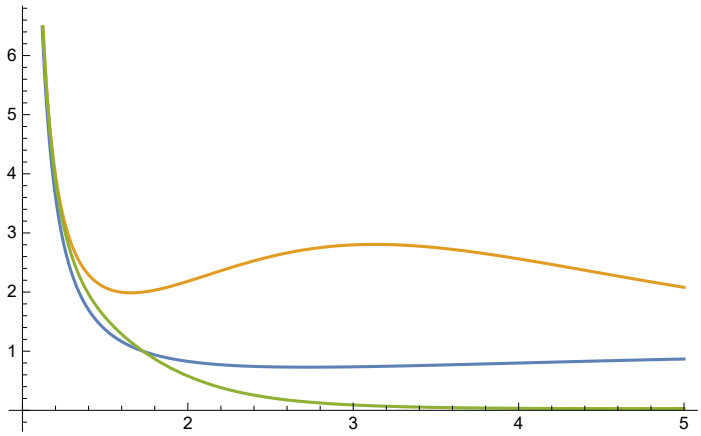
```
0.411234
```

```
Zeta[5, Zeta[5]] // N
```

```
0.868065
```

```
Plot[{Zeta[x, Zeta[x]]}, {x, 1, 5}]
Plot[{Zeta[x, Zeta[x]], Zeta[x, Zeta[x, Zeta[x]]],
  Zeta[x, Zeta[x, Zeta[x, Zeta[x]]]]}, {x, 1, 5}]
```






```
Zeta[E, Zeta[E]] // N
Zeta[E + 0.01, Zeta[E + 0.01]] // N
Zeta[E - 0.01, Zeta[E - 0.01]] // N
```

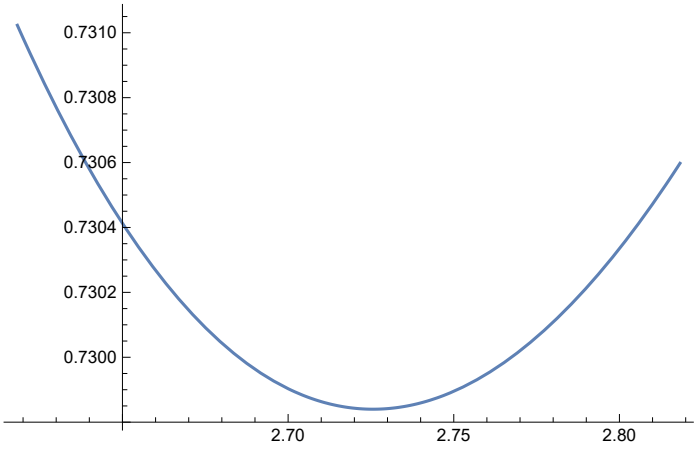
```
0.729845
```

```
0.729841
```

```
0.729869
```

Maybe the minimum of an infiniteyl recursive zeta is E and it has a local max at π????

```
Plot[{Zeta[x, Zeta[x]]}, {x, E - .1, E + .1}]
E // N
```




```
2.71828
```