```
Limit[(1 + Log[x] / n)^n, {n → Infinity}]
```

$$\{x\}$$

```
K[n_, 0] := K[n, 0] = If[n == 1, 1, 0]
K[n_, 1] := K[n, 1] = If[n == 1, 0, FullSimplify[MangoldtLambda[n] / Log[n]]]
K[n_, k_] := K[n, k] = Sum[K[j, k - 1] K[n / j, 1], {j, Divisors[n]}]


K2[n_ ] := K2[n] = Sum[ (-1)^(k + 1) / k K[n, k], {k, 1, Log[2, n]}]
PK2[n_, 0] := PK2[n, 0] = 1
PK2[n_, 1] := PK2[n, 1] = Sum[ K2[j], {j, 2, n}]
PK2[n_, k_] := PK2[n, k] = Sum[ K2[j] PK2[Floor[n / j], k - 1], {j, 2, n}]

Table[PK2[n, 1], {n, 2, 100}]
```

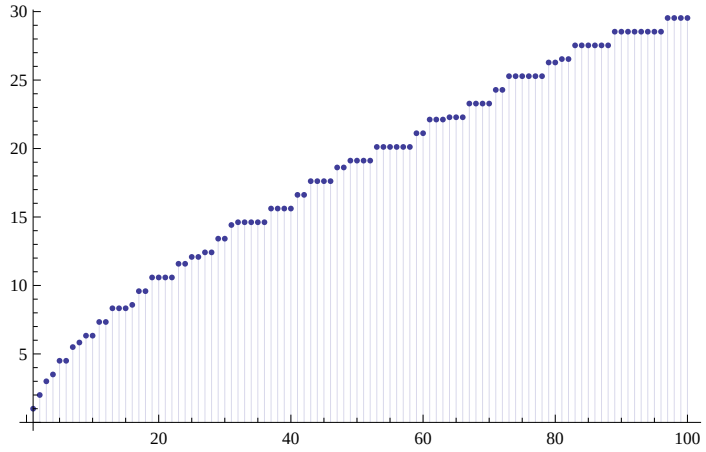
$$\left\{1, 2, 2, 3, 2, 3, \frac{19}{6}, \frac{19}{6}, \frac{13}{6}, \frac{19}{6}, \frac{11}{3}, \frac{14}{3}, \frac{11}{3}, \frac{8}{3}, \frac{65}{24}, \frac{89}{24}, \frac{101}{24}, \frac{125}{24}, \frac{137}{24},\right.$$
$$\frac{113}{24}, \frac{89}{24}, \frac{113}{24}, \frac{35}{8}, \frac{35}{8}, \frac{27}{8}, \frac{85}{24}, \frac{97}{24}, \frac{121}{24}, \frac{169}{24}, \frac{193}{24}, \frac{973}{120}, \frac{853}{120}, \frac{733}{120}, \frac{613}{120},$$
$$\frac{523}{120}, \frac{643}{120}, \frac{523}{120}, \frac{403}{120}, \frac{121}{40}, \frac{161}{40}, \frac{241}{40}, \frac{281}{40}, \frac{301}{40}, \frac{321}{40}, \frac{281}{40}, \frac{321}{40}, \frac{983}{120}, \frac{983}{120},$$
$$\frac{1043}{120}, \frac{923}{120}, \frac{983}{120}, \frac{1103}{120}, \frac{1063}{120}, \frac{943}{120}, \frac{301}{40}, \frac{261}{40}, \frac{221}{40}, \frac{261}{40}, \frac{181}{40}, \frac{221}{40}, \frac{181}{40}, \frac{201}{40},$$
$$\frac{911}{180}, \frac{731}{180}, \frac{1091}{180}, \frac{1271}{180}, \frac{1361}{180}, \frac{1181}{180}, \frac{1541}{180}, \frac{1721}{180}, \frac{1841}{180}, \frac{2021}{180}, \frac{1841}{180}, \frac{1931}{180},$$
$$\frac{2021}{180}, \frac{1841}{180}, \frac{2201}{180}, \frac{2381}{180}, \frac{2411}{180}, \frac{4837}{360}, \frac{4477}{360}, \frac{4837}{360}, \frac{4117}{360}, \frac{3757}{360}, \frac{3397}{360}, \frac{3037}{360},$$
$$\left.\frac{2917}{360}, \frac{3277}{360}, \frac{2557}{360}, \frac{2197}{360}, \frac{2377}{360}, \frac{2017}{360}, \frac{1657}{360}, \frac{1297}{360}, \frac{251}{72}, \frac{323}{72}, \frac{359}{72}, \frac{395}{72}, \frac{341}{72}\right\}$$

```
PA[n_, a_] := Sum[ a^k / k ! PK2[n, k], {k, 0, Log[2, n]}]

PA[100, 1] - 1
```

$$\frac{428}{15}$$

```
DiscretePlot[ PA[n, 1], {n, 1, 100}]
```



```
DiscretePlot[ PA[n, 1], {n, 1, 100}]
```