Lösungen / Statistik 2/11

```
Remove["Global`*"]
```

1.

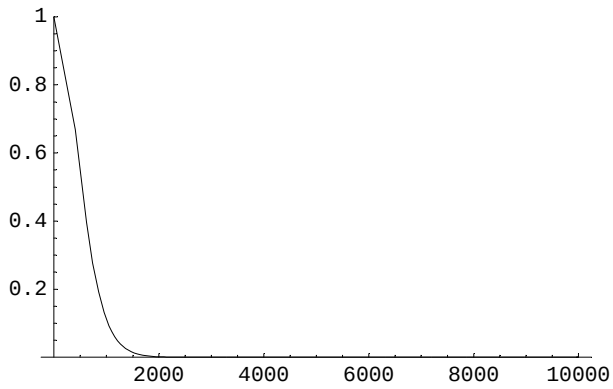
a

```
lHyp[nN_, n_, p_, c_] :=
 Sum[Binomial[p nN, m] Binomial[nN (1 - p), n - m] / Binomial[nN, n], {m, 0, c}]
```

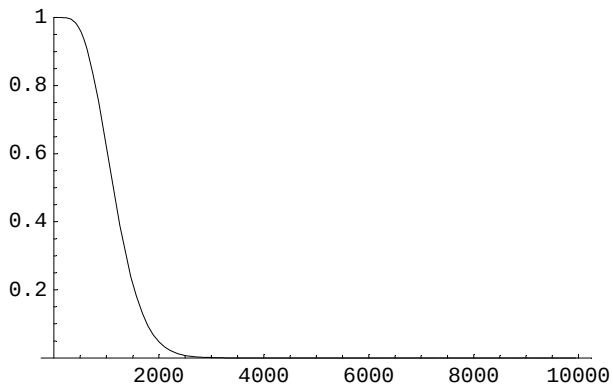
```
uN = 10000
```

```
10000
```

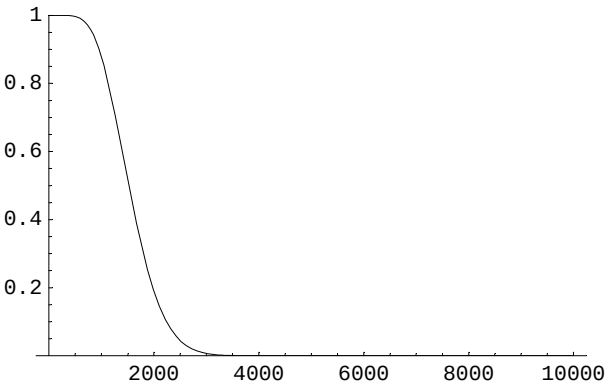
```
Plot[lHyp[uN, 50, mM / uN, 2], {mM, 0, uN}, PlotRange → {0, 1}];
```




```
Plot[lHyp[uN, 50, mM / uN, 5], {mM, 0, uN}, PlotRange → {0, 1}];
```



```
Plot[lHyp[uN, 50, mM / uN, 7], {mM, 0, uN}, PlotRange → {0, 1}];
```



b

1

```
β = Table[lHyp[uN, 50, p, 7], {p, 0.1, 0.3, 0.05}]
```

```
{0.878397, 0.518612, 0.189754, 0.0448666, 0.00715178}
```

```
Table[lHyp[uN, 50, 0.2, k], {k, 2, 7}]
```

```
{0.00126, 0.00556938, 0.0182823, 0.0476286, 0.102819, 0.189754}
```

2

```
M = uN * 0.2
```

```
2000.
```

3

```
lHyp[uN, 50, 0.2, 2]
```

```
0.00126
```

```
lHyp[uN, 50, N[2000 / 10000], 2]
```

```
0.00126
```

4

```
1 - lHyp[uN, 50, 0.2, 2]
```

```
0.99874
```

5

```
lHyp[uN, 50, 0.3, 2]
```

$$4.27646 \times 10^{-6}$$

c

1

```
Table[lHyp[uN, 50, 0.1, k], {k, 2, 7}]
```

```
{0.111125, 0.249605, 0.430781, 0.61617, 0.770643, 0.878397}
```

```
α = Table[1 - lHyp[uN, 50, 0.1, k], {k, 2, 7}]
```

```
{0.888875, 0.750395, 0.569219, 0.38383, 0.229357, 0.121603}
```

2

```
M = uN * 0.1
```

```
1000.
```

3

```
lHyp[uN, 50, 0.1, 7]
```

```
0.878397
```

```
lHyp[uN, 50, N[1000 / 10000], 7]
```

```
0.878397
```

4

```
1 - lHyp[uN, 50, 0.1, 7]
```

```
0.121603
```

5

```
1 - lHyp[uN, 50, 0.05, 7]
```

```
0.00310034
```

2.

Ablesen: Ca. 20.0525 bis 20.0625.