```
N := 30 : for n from 1 to N do for m from 1 to n - 1 do f[n, n, m] := 0 od: f[n, n, n] := 1 : for k
   from 1 to n do for m from n + 1 to N do f[n, k, m] := 0 od od: for k from 1 to n do for m
   from 1 to k - 1 do f[n, k, m] := 0 od od od: for n from 2 to N  do for k from n - 1 to 2 by -1
   do for m from k + 1 to n do f[n, k, m] := k/(2*n - k) * (f[n - 1, k - 1, m]) + (2*n - 2*k)/(2*n - k) * f[n,
   k + 1, m]: f[n, k, k] := k/(2*n - k) * add(f[n - 1, k - 1, mp], mp = 1 ..k) + (2*n - 2*k)/(2*n - k) * f[n, k
    + 1, k] od od : for m from 1 to n do f[n, 1, m] := 1/(2*n - 1) * f[n - 1, 1, m] + (2*n - 2)/(2*n - 1) * f[n,
   2, m] od: od:  for n from 1 to N do print("expected value", n, add(f[n, 1, m]*m, m = 1 ..n),
    evalf(add(f[n, 1, m]*m, m = 1 ..n))) od:
```

#NOTE f[n,k,m] is the probability that the maximum number of socks on the bed from this point on will be m, given that we currently have n pairs of socks in play and there are k socks on the bed now.

"expected value", 1, 1, 1.

"expected value", 2, $\frac{5}{3}$, 1.666666667

"expected value", 3, $\frac{7}{3}$, 2.333333333

"expected value", 4, $\frac{311}{105}$, 2.961904762

"expected value", 5, $\frac{3377}{945}$, 3.573544974

"expected value", 6, $\frac{3943}{945}$, 4.172486772

"expected value", 7, $\frac{18385}{3861}$, 4.761719762

"expected value", 8, $\frac{10831151}{2027025}$, 5.343373170

"expected value", 9, $\frac{203961377}{34459425}$, 5.918885095

"expected value", 10, $\frac{4248732053}{654729075}$, 6.489297963

"expected value", 11, $\frac{1021124893}{144729585}$, 7.055398473

"expected value", 12, $\frac{2409006894311}{316234143225}$, 7.617795061

"expected value", 13, $\frac{1319304498593}{161343950625}$, 8.176969099

"expected value", 14, $\frac{1864195055263613}{213458046676875}$, 8.733308883

$$\text{"expected value"}, 15, \frac{499912897075649}{53828550901125}, 9.287132734$$

$$\text{"expected value"}, 16, \frac{65104674955222699}{6617199446983125}, 9.838705252$$

$$\text{"expected value"}, 17, \frac{6578524797 1229129537}{633265987 0762850625}, 10.38824906$$

$$\text{"expected value"}, 18, \frac{10967776372033537513}{1002909934283709375}, 10.93595347$$

$$\text{"expected value"}, 19, \frac{818794491347250948689}{71311256805546883125}, 11.48198094$$

$$\text{"expected value"}, 20, \frac{22626108475283218340 0743}{1881358745722810416 5625}, 12.02647211$$

$$\text{"expected value"}, 21, \frac{1152625100577317466744319}{91699793410405514709375}, 12.56954959$$

$$\text{"expected value"}, 22, \frac{73929760928017379273943635 33}{5638620296805835099479468 75}, 13.11132104$$

$$\text{"expected value"}, 23, \frac{98971426697695579513270096 81}{7249654667321787985045031 25}, 13.65188154$$

$$\text{"expected value"}, 24, \frac{457408419333327691995322190243}{32231572777687408744321828125}, 14.19131553$$

$$\text{"expected value"}, 25, \frac{8607423207841693911477908790 59297}{584358414459472720534554743 90625}, 14.72969841$$

$$\text{"expected value"}, 26, \frac{4549943098085006830421799812 3975093}{298022791374331087472622919 3921875}, 15.26709779$$

$$\text{"expected value"}, 27, \frac{12266375744273560924193189197 74641}{7761772944884298592653078490 3125}, 15.80357456$$

$$\text{"expected value"}, 28, \frac{14194444318124268820703134529 1907073351}{8687364368561751199826958100 282265625}, 16.33918380$$

$$\text{"expected value"}, 29, \frac{11936644702878951357180416606 58069961511}{7073996700114568834144808738 8012734375}, 16.87397550$$

$$\text{"expected value"}, 30, \frac{25053454926741072480787806843 47543728951}{1439192432092274349015667984 79060390625}, 17.40799518 \quad \textbf{(1)}$$