

Von der Binomial- zur Poisson-Verteilung

Prof. Dr. Dörte Haftendorn 9.5.08 MuPAD 4 Update vom 13. Juni 08

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www.mathematik-verstehen.de

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Definition, die ein Histogramm passend zeichnet .

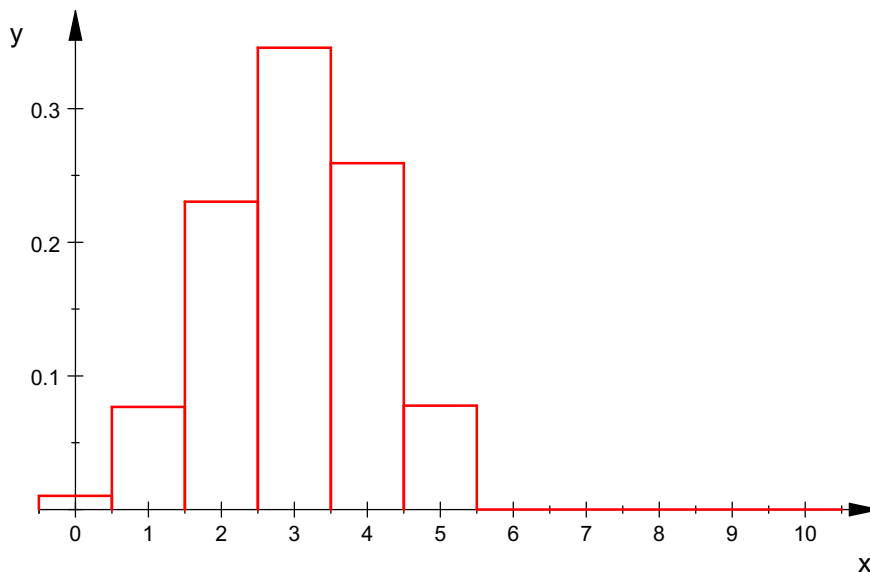
Für $w=1$ werden alle Werte ausgegeben, für $w=0$ nur my und $sigma$

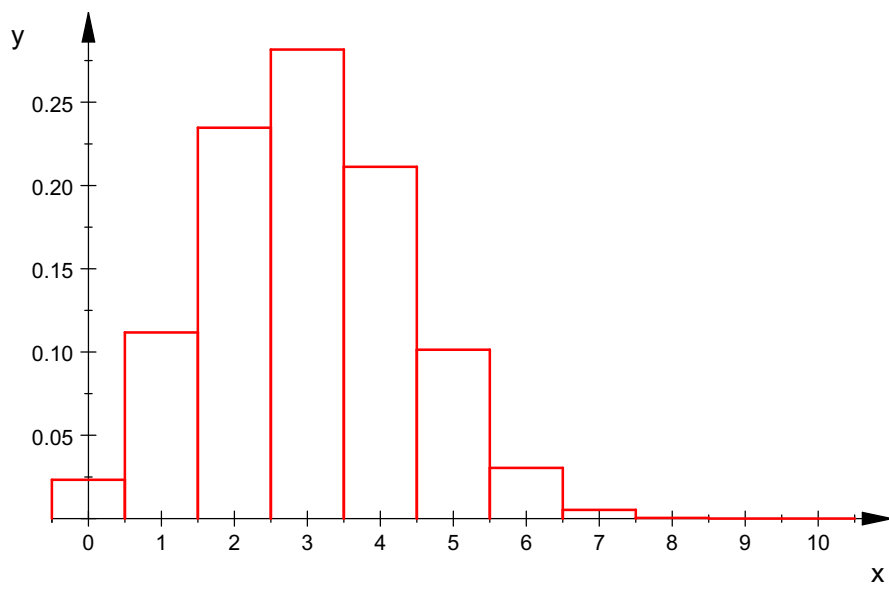
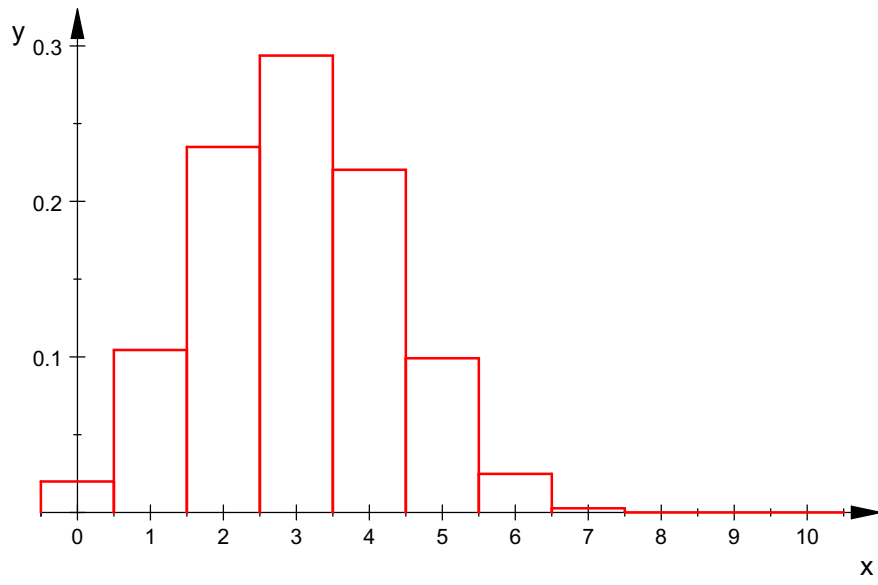
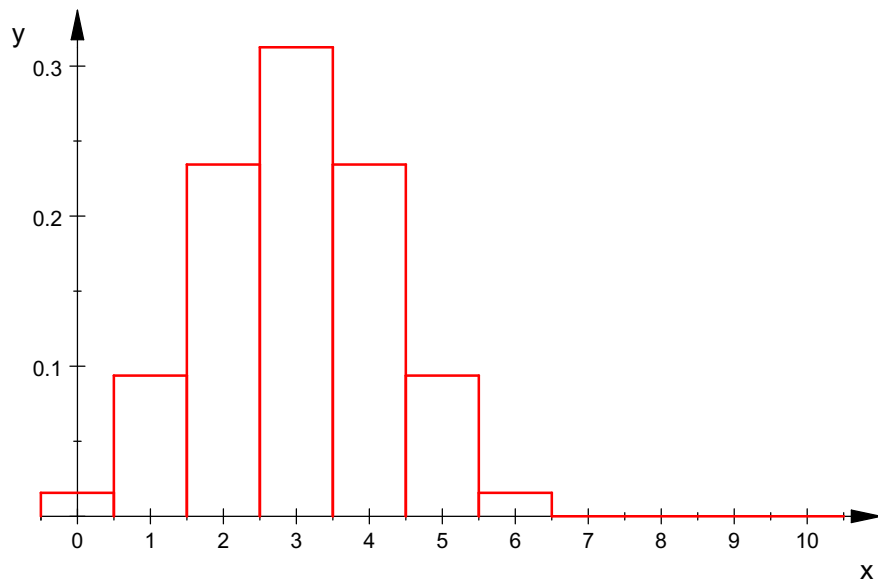
```
bipoiHist:=proc(n,my,kmin,kmax,w)
//w=1 alle Werte, w=0 nur my, sigma
local i,bipf,kmi,kma,li;
begin
p:=my/n;
bipf:=stats::binomialPF(n,p);
kmi:=round(kmin): kma:=round(kmax):
i:=kmi:li:=[]:
werte:=[i,bipf(i)] $ i=kmi..kma;
for i from kmi to kma do
li:=li. [[i-0.5,0],[i-0.5,bipf(i)],[i+0.5,bipf(i)],[i+0.5,0]];
end_for;
hist:=plot::Polygon2d(li,LineColor=[1,0,0]);
plot(hist);
if w=1 then
return(matrix(float([werte])));
else return(float(["my",n*p]),
float(["sigma",sqrt(n*p*(1-p))]))
end_if;
end_proc;
```

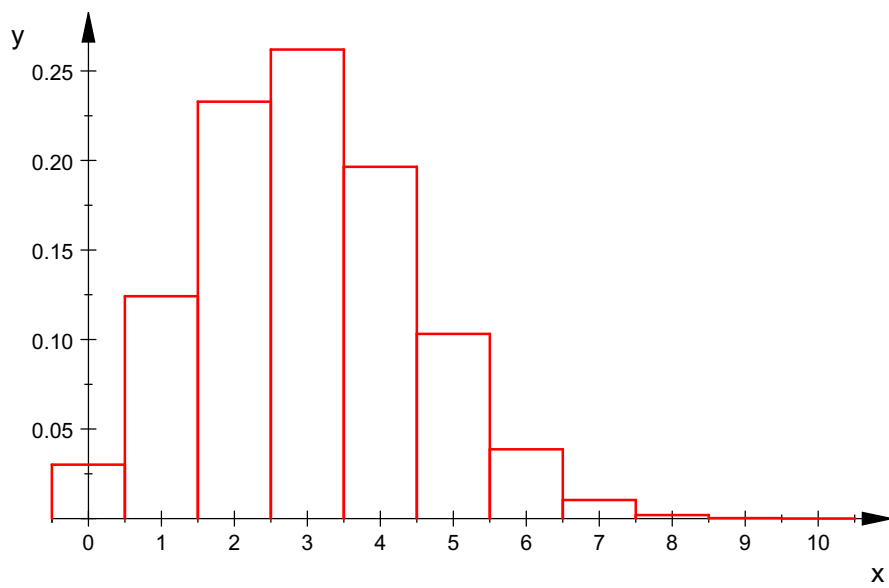
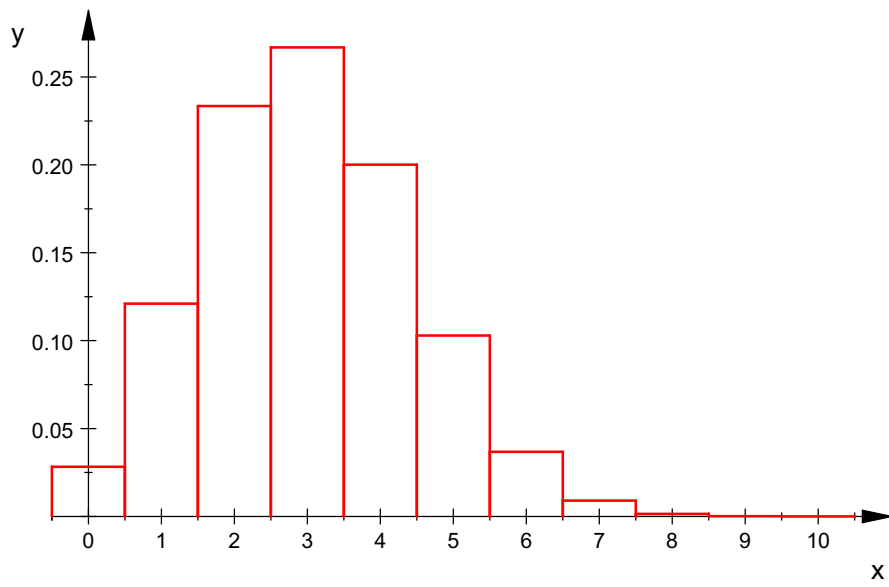
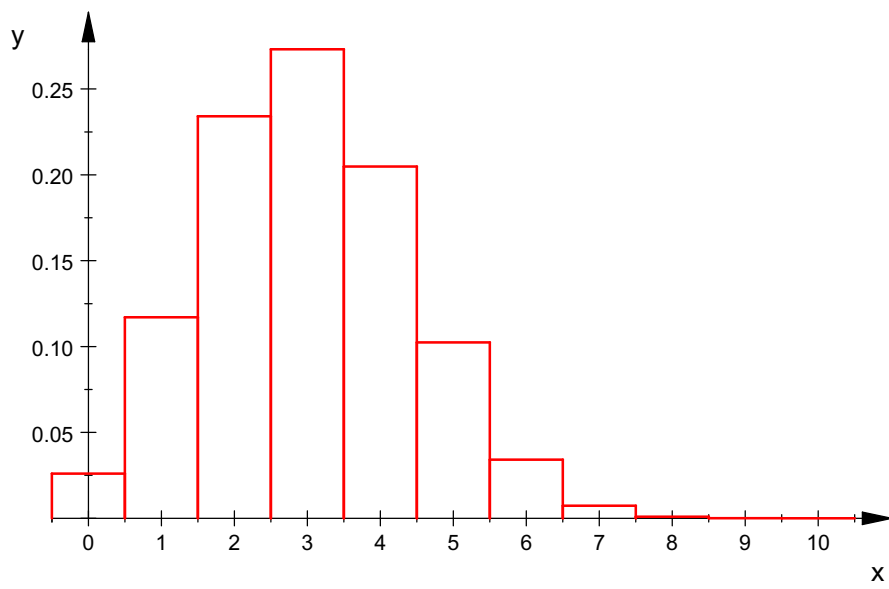
bipoiHist (n , my , kmin , kmax , w)

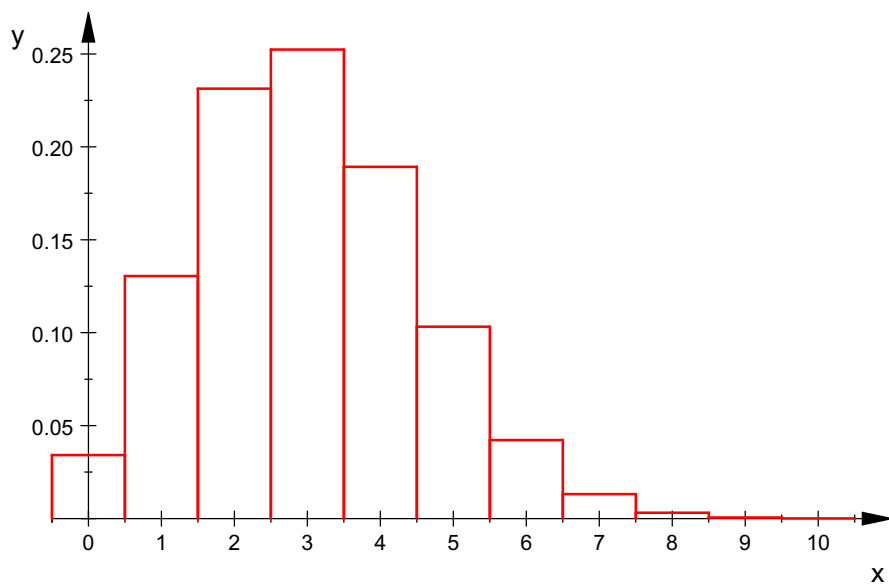
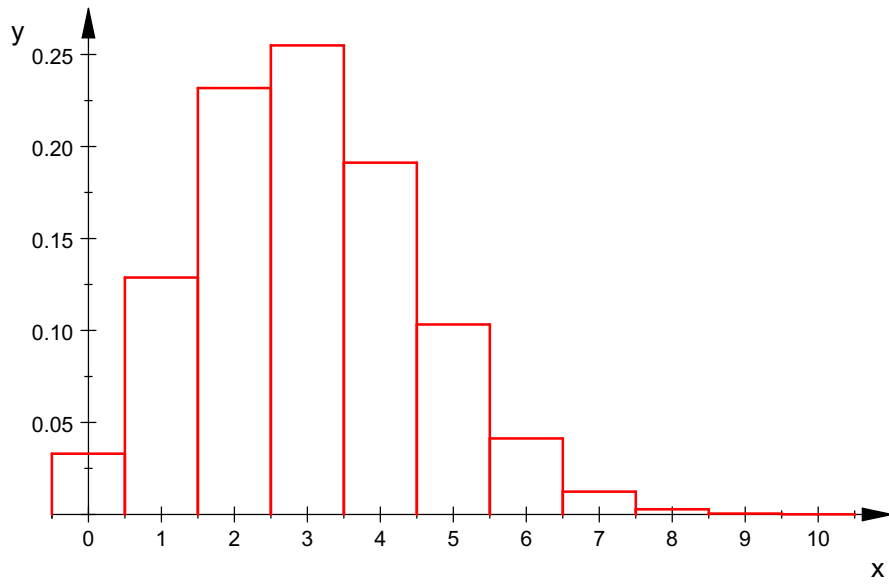
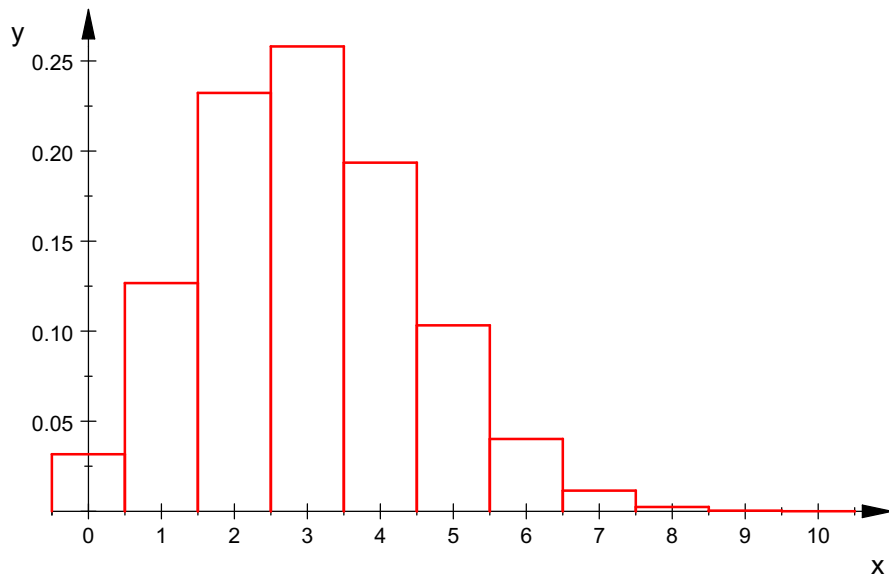
Für $w=1$ werden alle Werte ausgegeben, für $w=0$ nur my und $sigma$

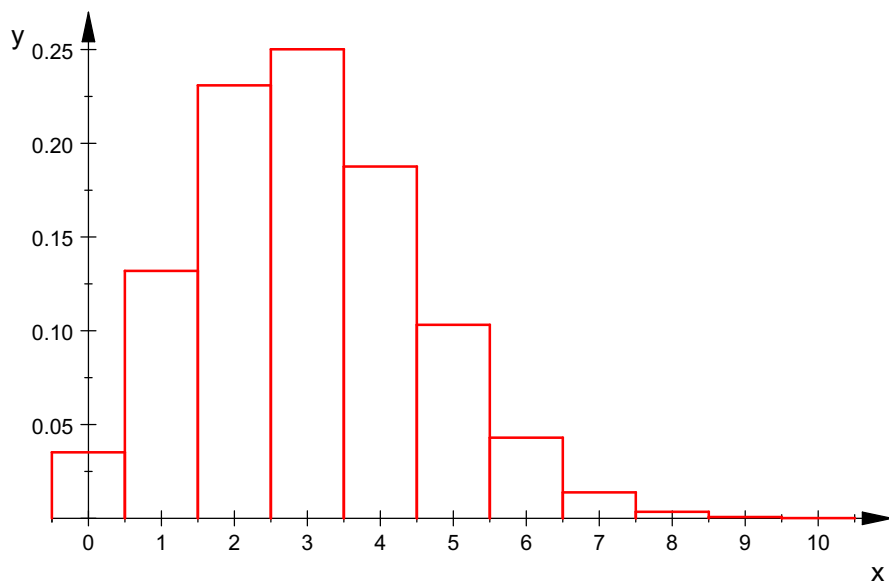
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bipoiHist(n,3,0,10,1) $ n=5..15
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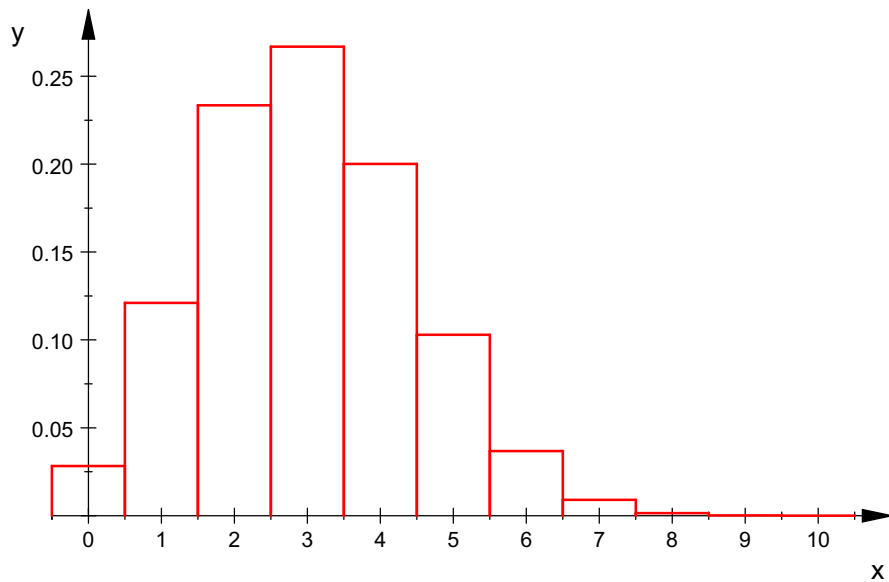


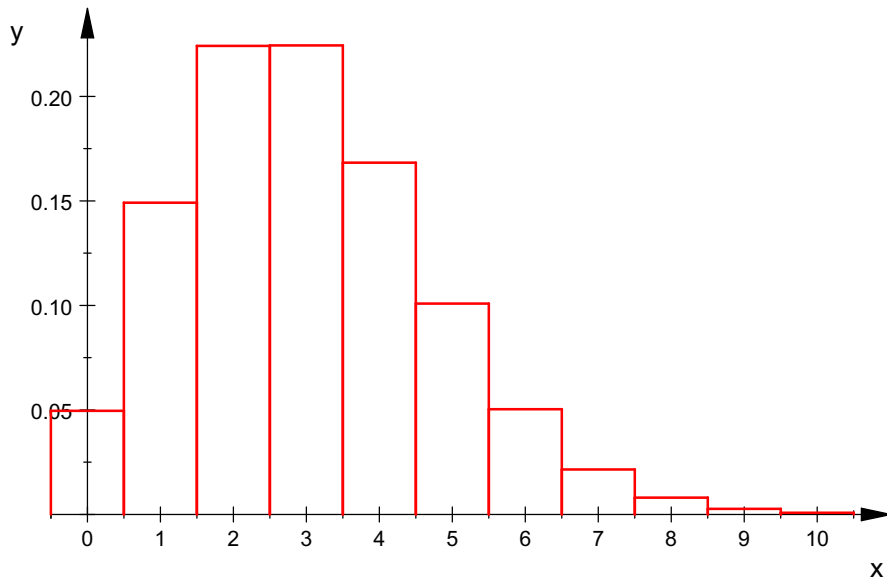
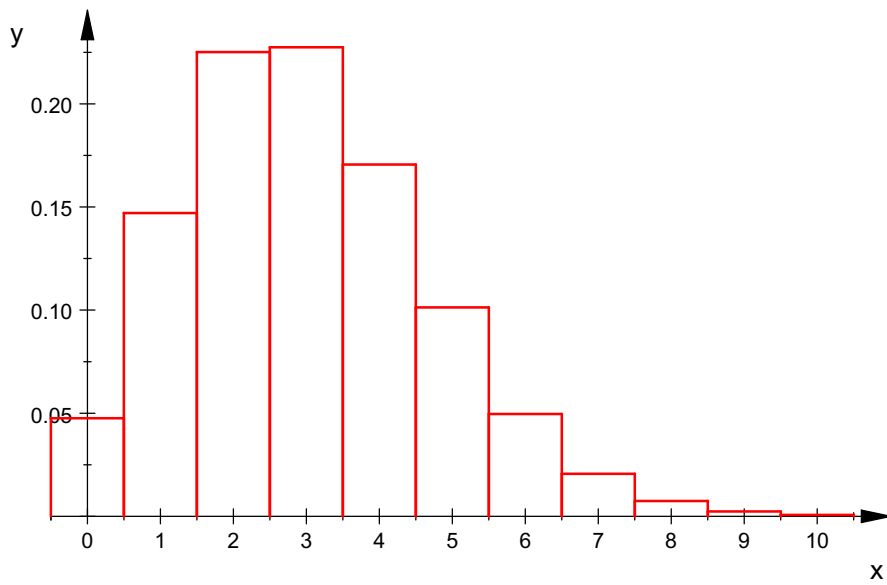




$\begin{pmatrix} 0 & 0.01024 \\ 1.0 & 0.0768 \\ 2.0 & 0.2304 \\ 3.0 & 0.3456 \\ 4.0 & 0.2592 \\ 5.0 & 0.07776 \\ 6.0 & 0 \\ 7.0 & 0 \\ 8.0 & 0 \\ 9.0 & 0 \\ 10.0 & 0 \end{pmatrix}$,	$\begin{pmatrix} 0 & 0.015625 \\ 1.0 & 0.09375 \\ 2.0 & 0.234375 \\ 3.0 & 0.3125 \\ 4.0 & 0.234375 \\ 5.0 & 0.09375 \\ 6.0 & 0.015625 \\ 7.0 & 0 \\ 8.0 & 0 \\ 9.0 & 0 \\ 10.0 & 0 \end{pmatrix}$,	$\begin{pmatrix} 0 & 0.01989452888 \\ 1.0 & 0.1044462766 \\ 2.0 & 0.2350041224 \\ 3.0 & 0.293755153 \\ 4.0 & 0.2203163648 \\ 5.0 & 0.09914236415 \\ 6.0 & 0.02478559104 \\ 7.0 & 0.00265559904 \\ 8.0 & 0 \\ 9.0 & 0 \\ 10.0 & 0 \end{pmatrix}$,	$\begin{pmatrix} 0 & 0.023283064 \\ 1.0 & 0.11175870 \\ 2.0 & 0.23469328 \\ 3.0 & 0.28163194 \\ 4.0 & 0.21122395 \\ 5.0 & 0.10138750 \\ 6.0 & 0.030416250 \\ 7.0 & 0.005214214 \\ 8.0 & 0.0003910660 \\ 9.0 & 0 \\ 10.0 & 0 \end{pmatrix}$
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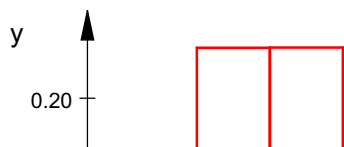
`bipoiHist(10^n,3,0,10,1) $ n=1..3`

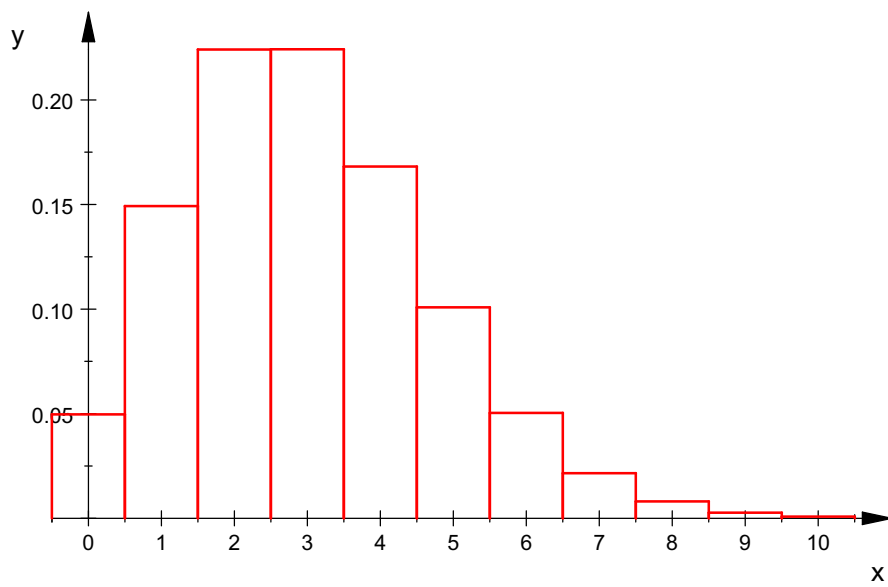




$\begin{pmatrix} 0 & 0.0282475249 \\ 1.0 & 0.121060821 \\ 2.0 & 0.2334744405 \\ 3.0 & 0.266827932 \\ 4.0 & 0.200120949 \\ 5.0 & 0.1029193452 \\ 6.0 & 0.036756909 \\ 7.0 & 0.009001692 \\ 8.0 & 0.0014467005 \\ 9.0 & 0.000137781 \\ 10.0 & 0.0000059049 \end{pmatrix}$,	$\begin{pmatrix} 0 & 0.04755250793 \\ 1.0 & 0.1470696121 \\ 2.0 & 0.2251529629 \\ 3.0 & 0.2274741275 \\ 4.0 & 0.1706055956 \\ 5.0 & 0.101308065 \\ 6.0 & 0.04960961947 \\ 7.0 & 0.02060370058 \\ 8.0 & 0.007407773789 \\ 9.0 & 0.002341976593 \\ 10.0 & 0.0006591336185 \end{pmatrix}$,	$\begin{pmatrix} 0 & 0.04956308282 \\ 1.0 & 0.1491366584 \\ 2.0 & 0.2241537439 \\ 3.0 & 0.2243785721 \\ 4.0 & 0.1682839291 \\ 5.0 & 0.1008690833 \\ 6.0 & 0.05033336904 \\ 7.0 & 0.02150653482 \\ 8.0 & 0.008032593683 \\ 9.0 & 0.002664103288 \\ 10.0 & 0.000794421171 \end{pmatrix}$
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`bipoiHist(2000,3,0,10,1)`





0	0.0496750615
1.0	0.1492490581
2.0	0.224097797
3.0	0.2242100142
4.0	0.1681575107
5.0	0.1008439834
6.0	0.05037149395
7.0	0.0215553528
8.0	0.008067066499
9.0	0.002682289512
10.0	0.0008022691665