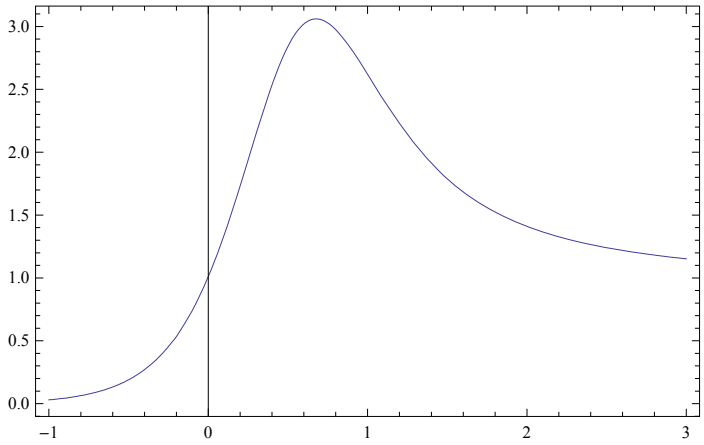
Unit 15, part 56.1
Contribution to Unit 15, part 55, p. 5
by Dr. Dagmar Schönfeld
calculated with Mathematica®

In[134]:=
```
anz = 100; k = 2; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[134]=

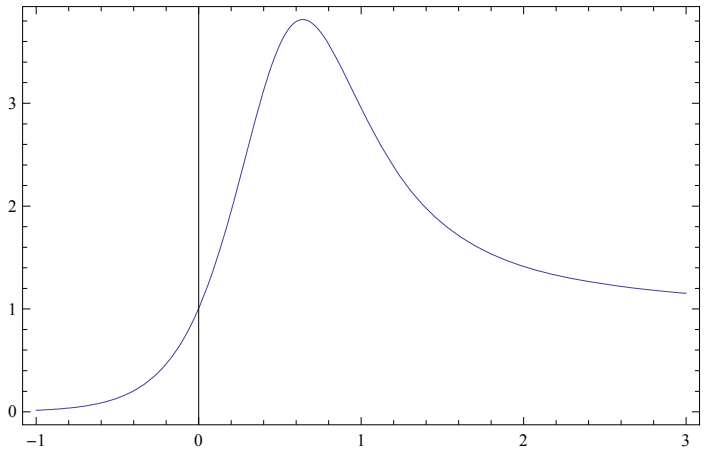



```
max=3.0603561441204201670
```

In[136]:=
```
anz = 200; k = 2; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[136]=

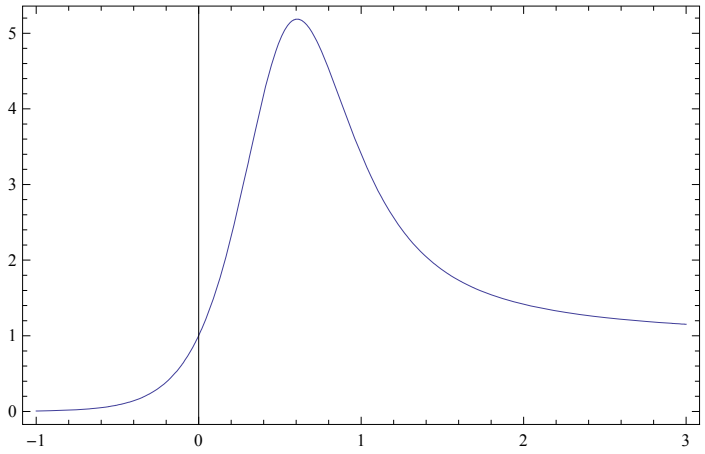



```
max=3.8135773619760519338
```

In[138]:=
```
anz = 500; k = 2; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[138]=

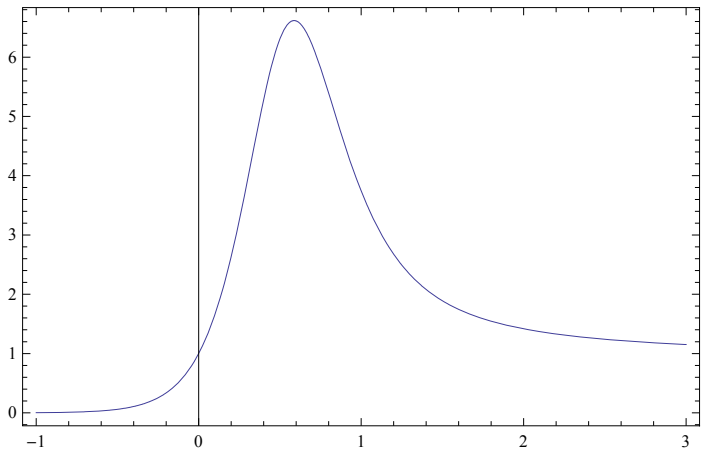



```
max=5.1860987331247366928
```

In[140]:=
```
anz = 1000; k = 2; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[140]=

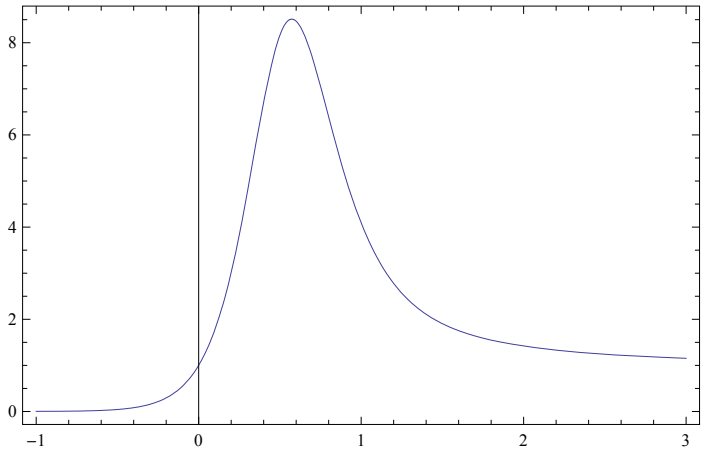



```
max=6.6161513637191673029
```

In[142]:=
```
anz = 2000; k = 2; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

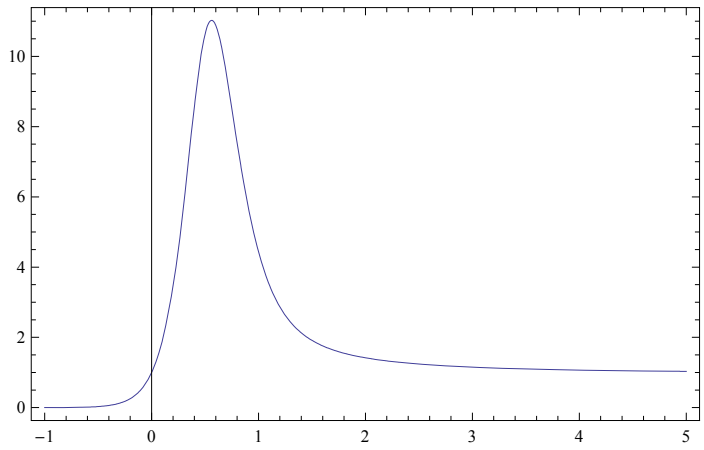
Out[142]=




```
max=8.5093832825507047020
```

In[144]:=
```
anz = 4000; k = 2; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 5}, PlotRange -> All, Frame -> True]
```

Out[144]=



In[145]:=
```
anz = 4000; k = 2; x = 10; N[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), 20]
```

Out[145]=
```
1.0009776068279153573
```

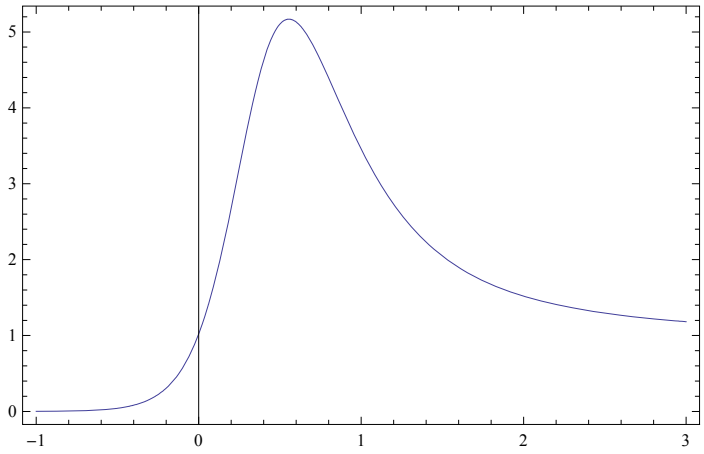
In[146]:=
```
anz = 4000; k = 2; x = 30; N[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), 20]
```

Out[146]=
```
1.0000000009313225755
```

In[118]:=
```
anz = 100; k = 3; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[118]=

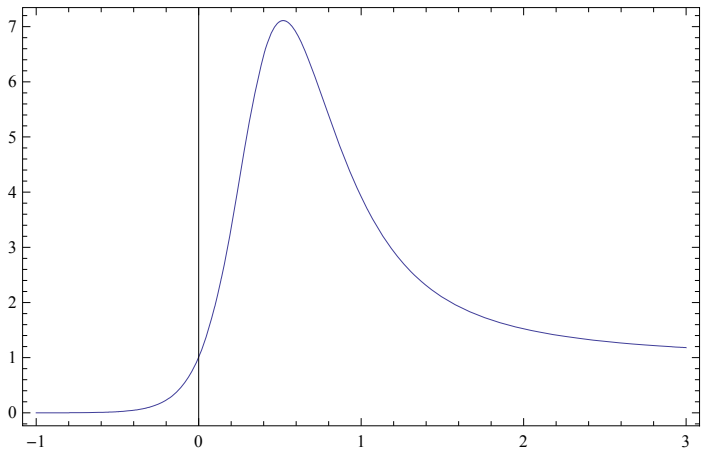



```
max=5.1678129279738404951
```

In[120]:=
```
anz = 200; k = 3; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[120]=

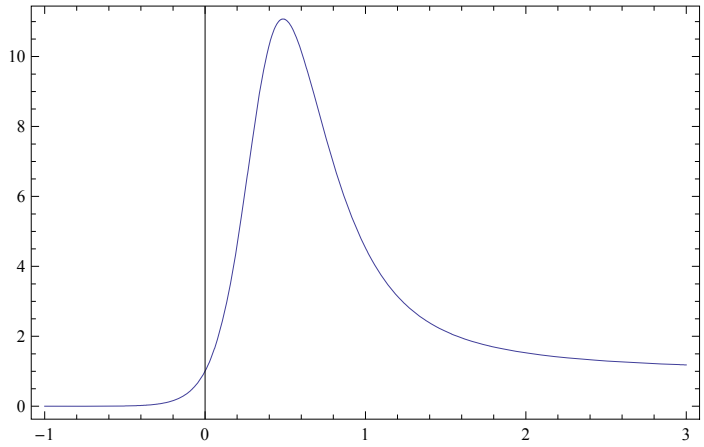



```
max=7.1095144137795443146
```

In[122]:=
```
anz = 500; k = 3; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[122]=

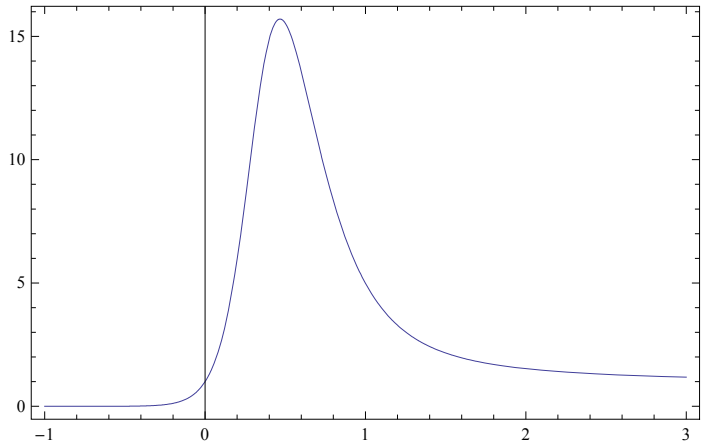



```
max=11.072824172144833353
```

In[124]:=
```
anz = 1000; k = 3; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[124]=

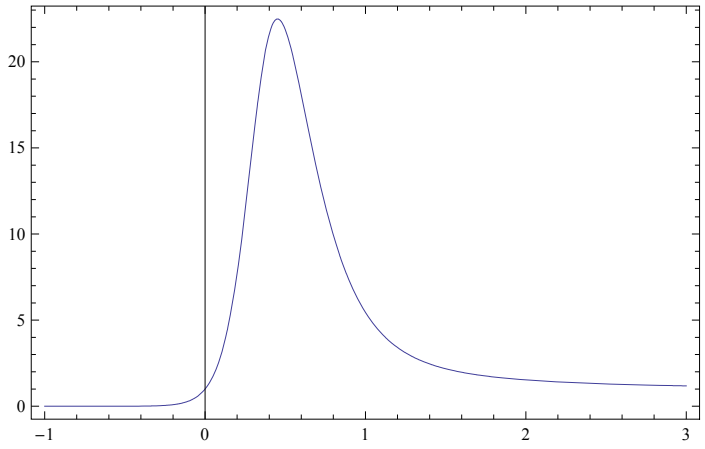



```
max=15.699238689277273561
```

In[126]:=
```
anz = 2000; k = 3; Plot[ (Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange → All, Frame → True]

Print["max=", N[Max[Table[ (Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

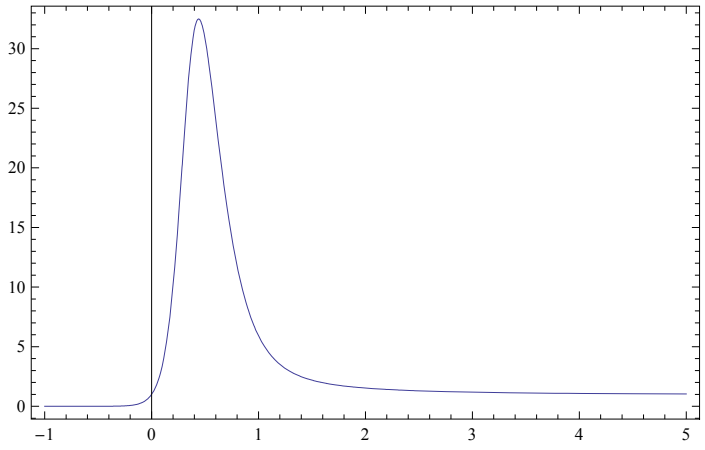
Out[126]=




```
max=22.484731730692276993
```

In[128]:=
```
anz = 4000; k = 3; Plot[ (Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 5}, PlotRange → All, Frame → True]
```

Out[128]=



In[132]:=
```
anz = 4000; k = 3; x = 10; N[ (Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), 20]
```

Out[132]=
```
1.0009936204057139363
```

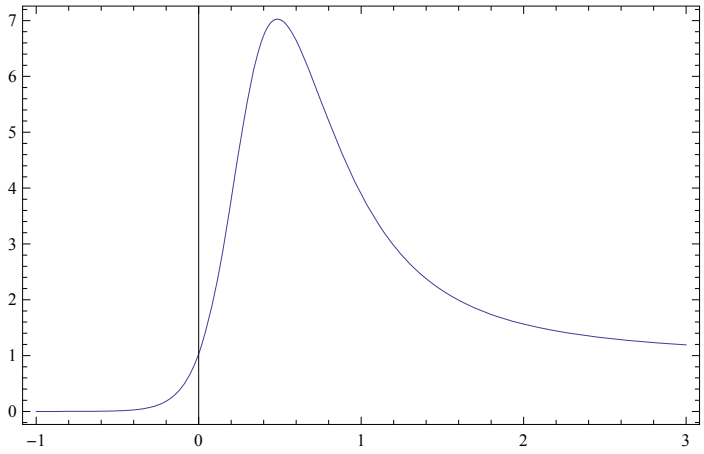
In[133]:=
```
anz = 4000; k = 3; x = 30; N[ (Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), 20]
```

Out[133]=
```
1.0000000009313274316
```

In[102]:=
```
anz = 100; k = 4; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[102]=

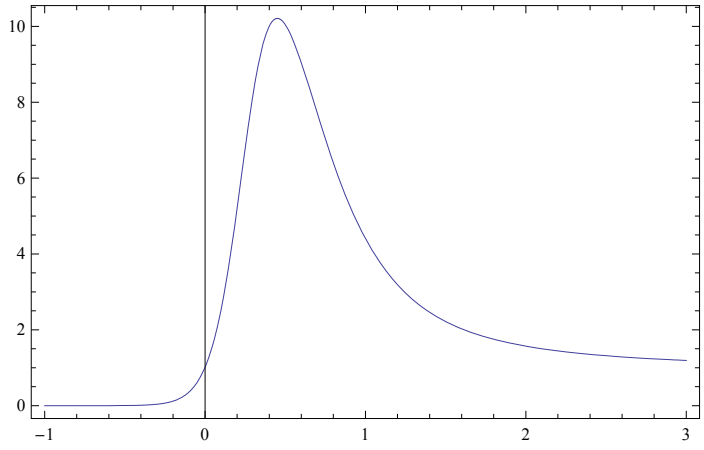



```
max=7.0243599546228641216
```

In[104]:=
```
anz = 200; k = 4; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[104]=

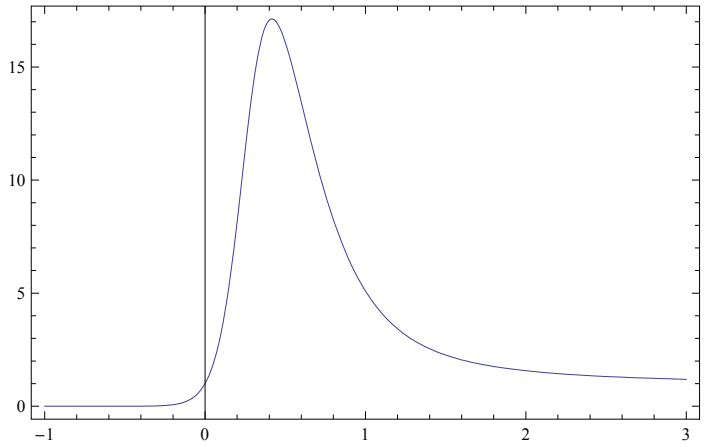



```
max=10.208429244213311924
```

In[106]:=
```
anz = 500; k = 4; Plot[ (Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[ (Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[106]=

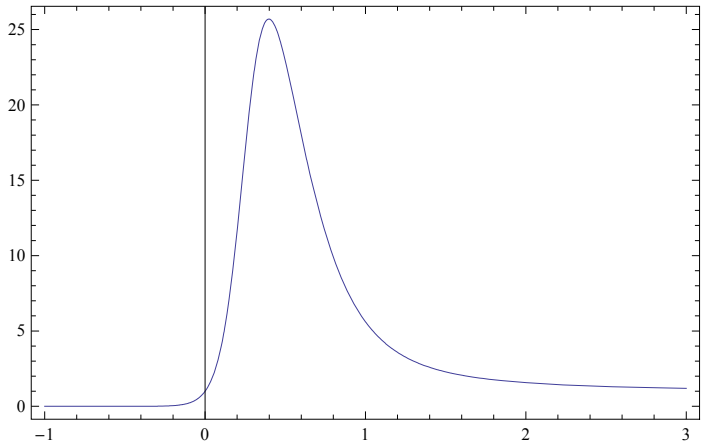



```
max=17.121617669434302432
```

In[108]:=
```
anz = 1000; k = 4; Plot[ (Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[ (Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[108]=

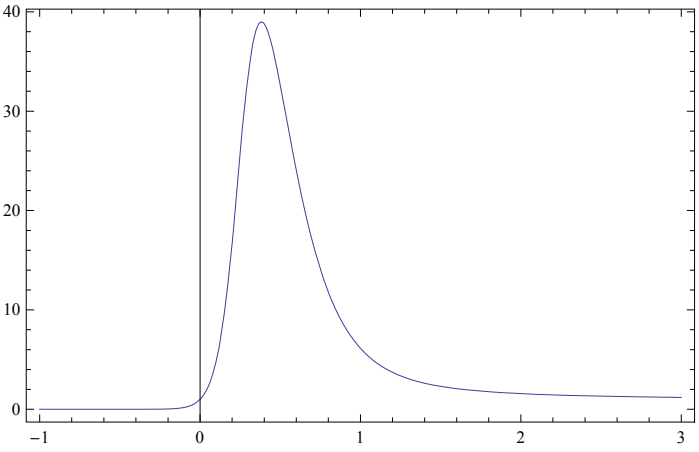



```
max=25.695487056735760978
```

In[110]:=
```
anz = 2000; k = 4; Plot[ Sum[1/i^x, {i, 1, anz}] / Sum[1/Binomial[i,k]^x, {i, k, anz}], {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[ Sum[1/i^x, {i, 1, anz}] / Sum[1/Binomial[i,k]^x, {i, k, anz}], {x, 0, 1, 1/100}]], 20]];
```

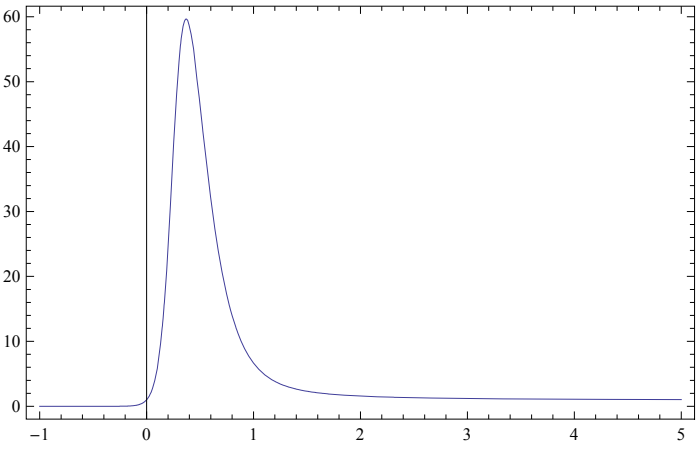
Out[110]=




```
max=38.969282838072306086
```

In[114]:=
```
anz = 4000; k = 4; Plot[ Sum[1/i^x, {i, 1, anz}] / Sum[1/Binomial[i,k]^x, {i, k, anz}], {x, -1, 5}, PlotRange -> All, Frame -> True]
```

Out[114]=



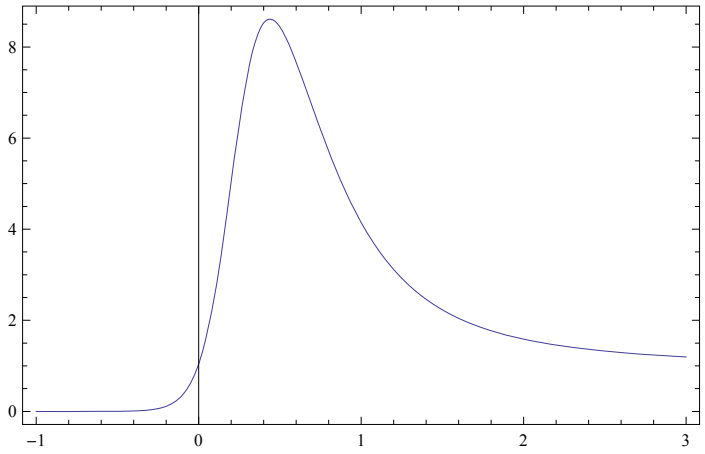
In[116]:=
```
anz = 4000; k = 4; x = 10; N[ Sum[1/i^x, {i, 1, anz}] / Sum[1/Binomial[i,k]^x, {i, k, anz}], 20]
```

Out[116]=
```
1.0009944726242478478
```

In[90]:=
```
anz = 100; k = 5; Plot[ (Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[ (Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[90]=

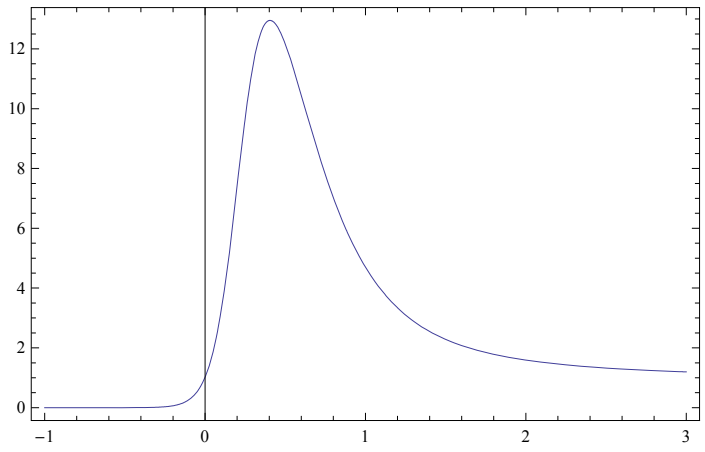



```
max=8.6105014723868054067
```

In[92]:=
```
anz = 200; k = 5; Plot[ (Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[ (Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[92]=

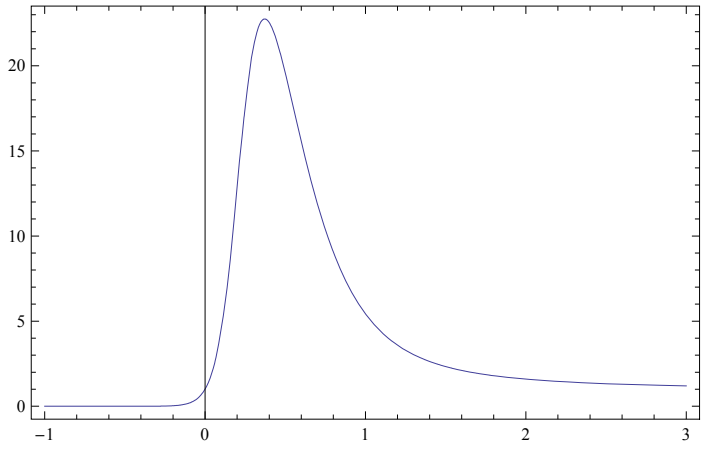



```
max=12.949006334435606302
```

In[94]:=
```
anz = 500; k = 5; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[94]=

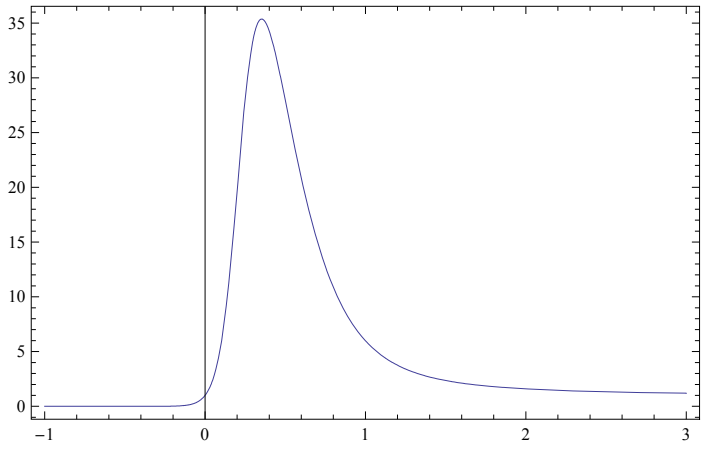



```
max=22.749416124589455941
```

In[96]:=
```
anz = 1000; k = 5; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange -> All, Frame -> True]

Print["max=", N[Max[Table[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

Out[96]=

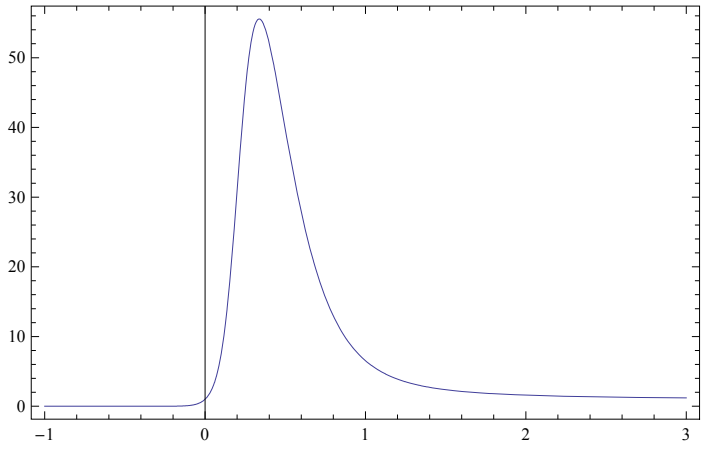



```
max=35.356873898031679347
```

In[99]:=
```
anz = 2000; k = 5; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange → All, Frame → True]

Print["max=", N[Max[Table[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, 0, 1, 1/100}]], 20]];
```

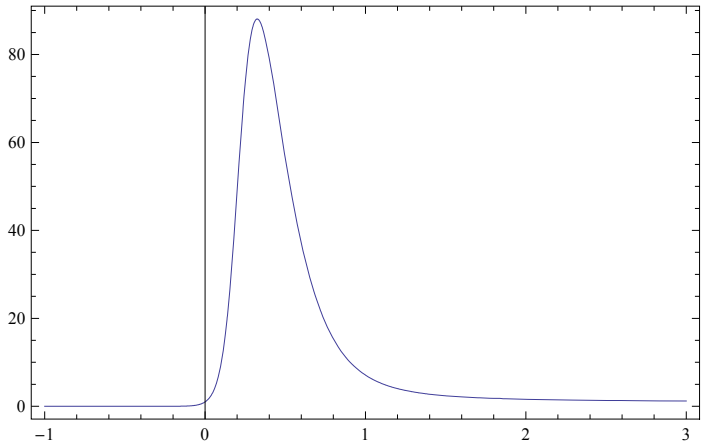
Out[99]=




```
max=55.546474473457479104
```

In[101]:=
```
anz = 4000; k = 5; Plot[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), {x, -1, 3}, PlotRange → All, Frame → True]
```

Out[101]=



In[117]:=
```
anz = 4000; k = 5; x = 10; N[(Sum[1/i^x, {i, 1, anz}])/(Sum[1/Binomial[i,k]^x, {i, k, anz}]), 20]
```

Out[117]=
```
1.0009945585731382016
```