78-APROX-bernstein

February 5, 2018

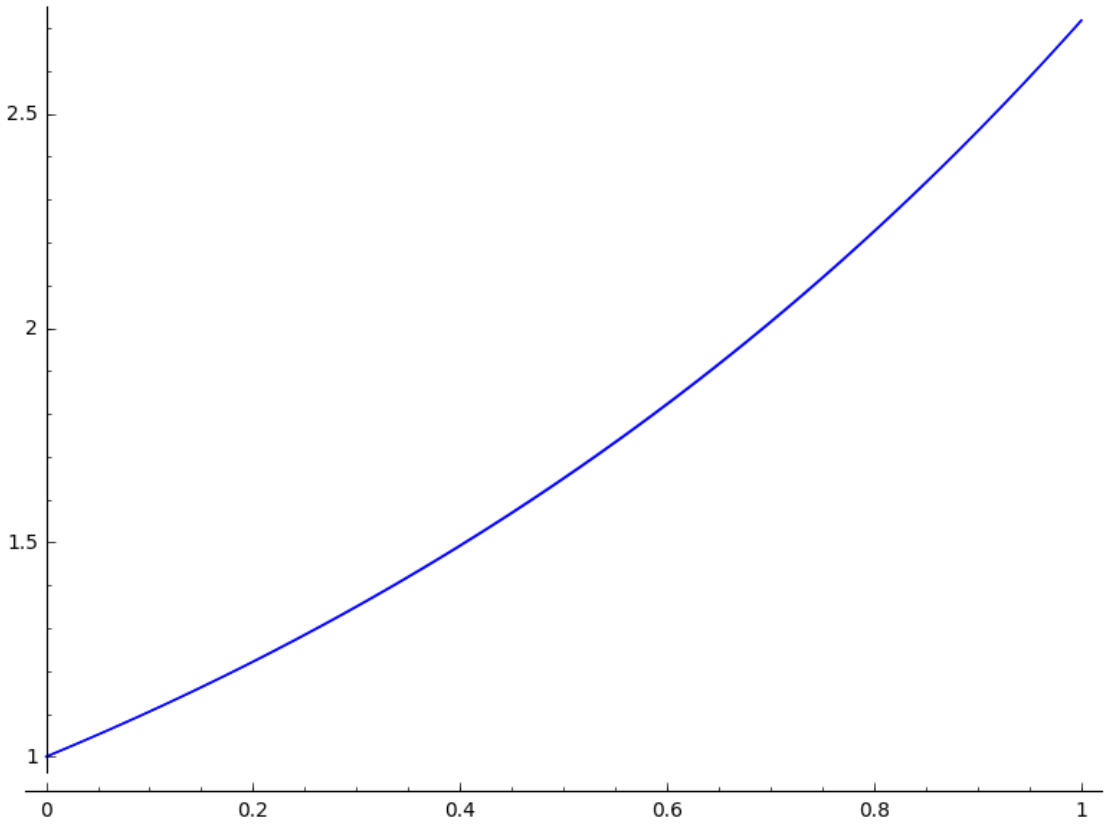
In [1]:
```
def B(n,f):
    var('t')
    return sum([binomial(n,p)*f(x=(p/n).n())*(1-t)^(n-p)*t^p for p in srange(n+1)])
```

In [2]:
```
f(x)=exp(x);
expand(B(15,f))
```

Out[2]:
```
(3.63797880709171e-12)*t^15 - (1.87583282240666e-12)*t^14 - (2.91038304567337e-11)*t^13
```

In [3]:
```
plot(f,0,1)+plot(B(100,f),0,1)
```

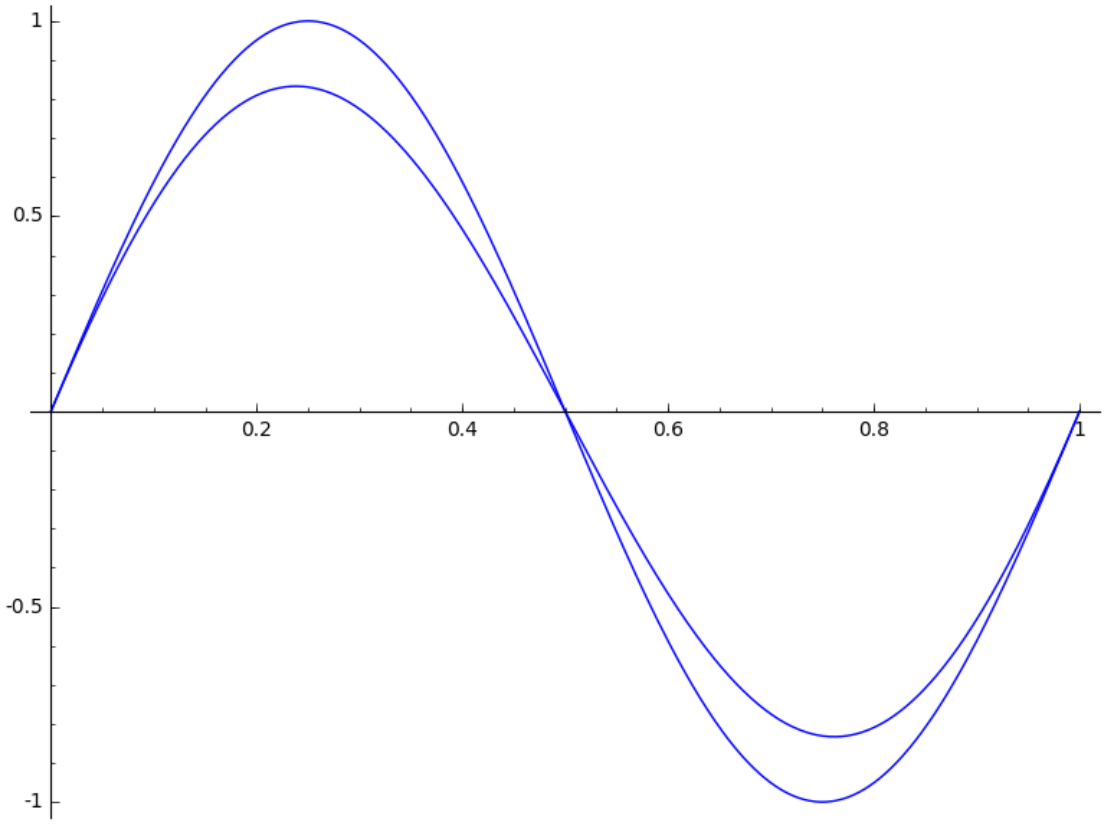
Out[3]:



In [4]: g(x)=sin(x*2*pi)

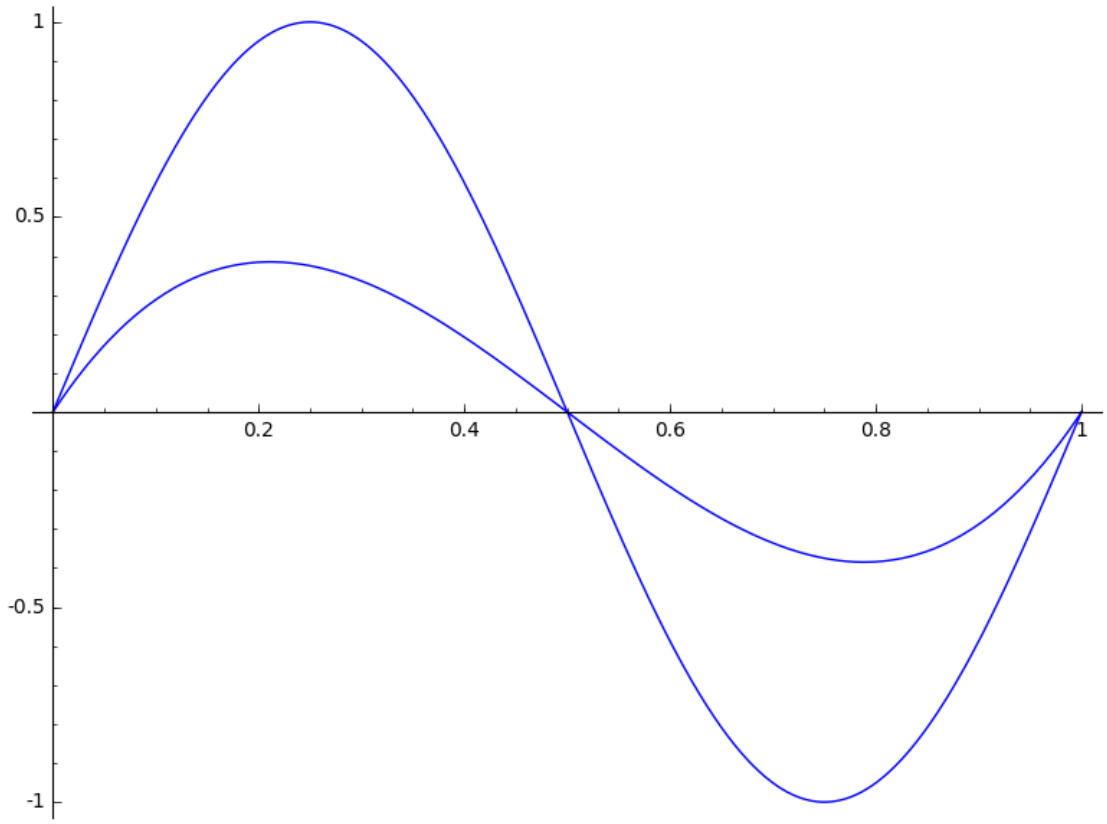
In [5]: plot(g,0,1)+plot(B(20,g),0,1)

Out[5]:



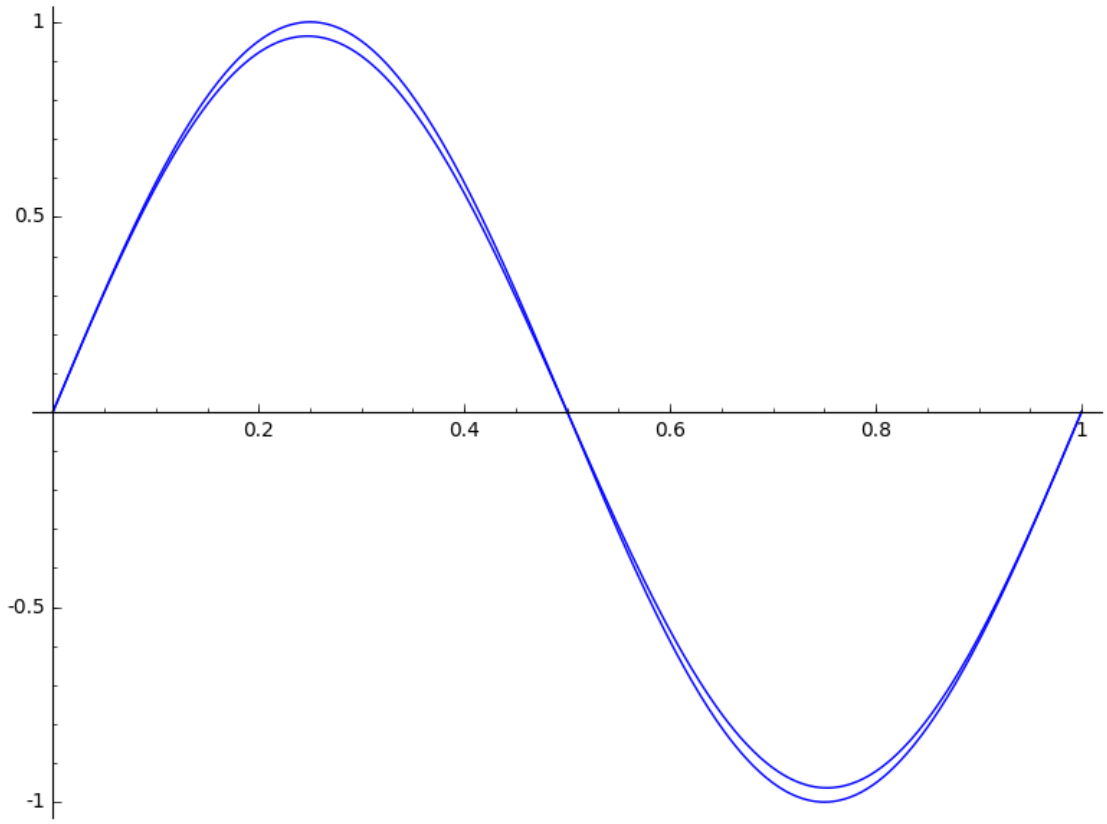
In [6]: plot(g,0,1)+plot(B(4,g),0,1)

Out[6]:




```
In [7]: plot(g,0,1)+plot(B(100,g),0,1)
```

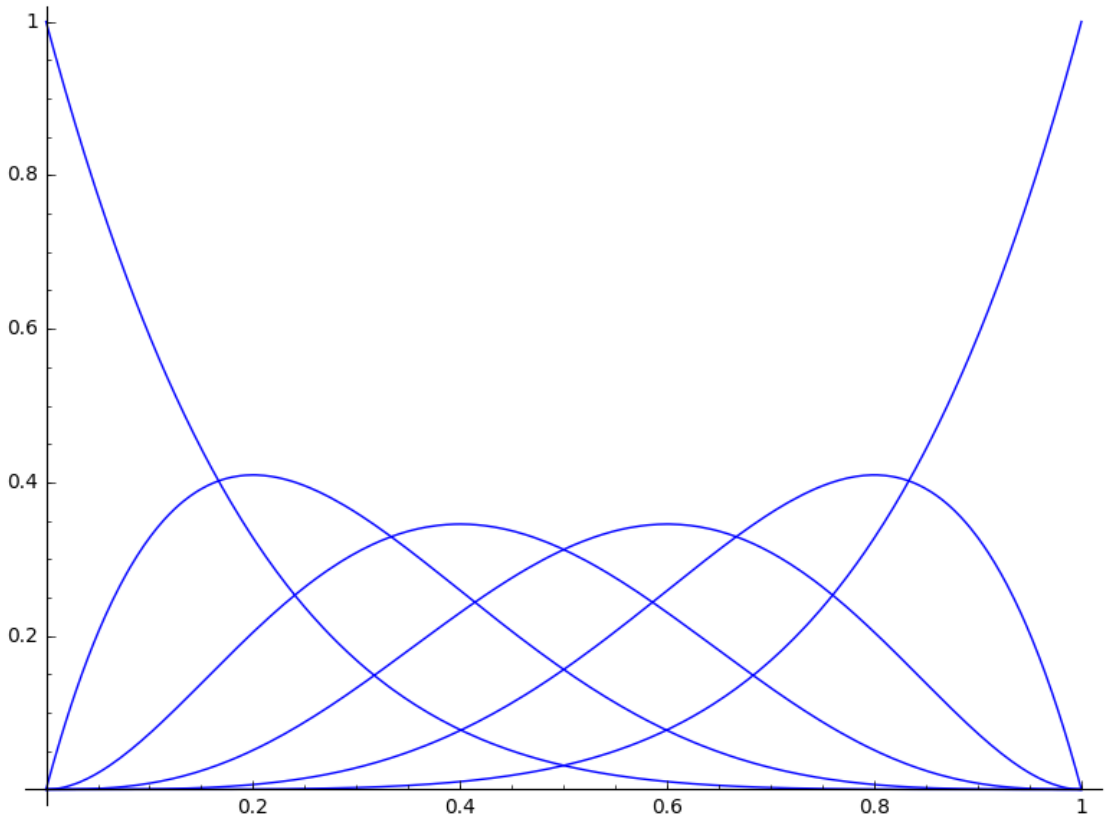
Out[7]:




```
In [8]: def b(n,p):
            var('t')
            return binomial(n,p)*(1-t)^(n-p)*t^p

In [11]: sum([plot(b(5,p),0,1) for p in srange(6)])
```

Out[11]:



In [10]: