lsg09

Aufgabe 1

```
def search(s1,s2):
  if s2.find(s1) <> -1:
     return s2.index(s1)
  else:
     return False


search('lo','Hallo')
```

```
3
```

```
def suche(s1, s2):
  l = len(s1)
  for i in [0..len(s2)-l]:
     if s1 == s2[i:i+l]:
        return i
  return False


suche('cde', 'abcdef')
```

```
2
```

Aufgabe 2

```
def einfuegen(str, n, x):
  vor = str[0:n]
  nach = str[n:len(str)]
  return vor + x + nach


einfuegen('abcd', 2, '1234')
```

```
'ab1234cd'
```

Aufgabe 3

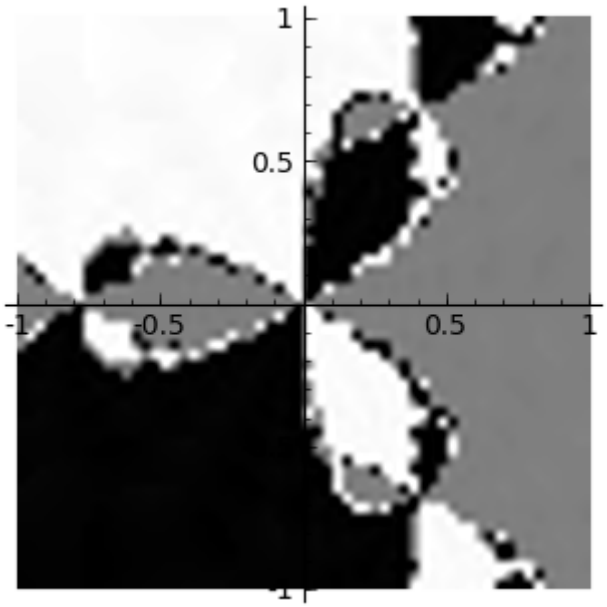
```
def pruefe_klammern(str):
  offen = 0
```

```
    for c in str:
        if c=="(":
            offen += 1
        elif c==")":
            offen -= 1
    return offen

pruefe_klammern("limit((abs(sin((2*n+1)*x))/(2*n+1))^(1/n),n=oo)")
```

```
0
```

Aufgabe 6

```
reset()
def newton(x,y):
    z = (x+I*y).n()
    eps = 0.2;
    for i in [1..20]:
        z = z - (z^3-1)/(3*z^2)
        if abs(z^3-1)<eps:
            return arg(z)
    return 0

density_plot(newton, (-1,1), (-1,1), plot_points=60)
```



Aufgabe 4

```
@interact
def _(b = range_slider (-20, 20, 1, default=(-19 ,3) , label='Range '), ty =
selector ([sin(x)/x,arctan(x)] , label ='Typ')):
   plot(ty, b[0] , b[1]).show(xmin=b[0], xmax=b[1])
```

Aufgabe 5

```
var('x')
x0  = 0
f   = sin(x)*e^(-x)
p   = plot(f,-1,5, thickness=2)
dot = point((x0,f(x=x0)),pointsize=80,rgbcolor=(1,0,0))
@interact
def tayl(order=slider(1,12,1,label='order'),ch = checkbox(label='Gitter
(an/aus)')):
   ft = f.taylor(x,x0,order)
   pt = plot(ft,-1, 5, color='green', thickness=2)
   print ('f(x) = %s'% f)
   print ('f^(x;%s) = %s + O(x^(%s))'%(x0,ft,order+1))
   show(dot + p + pt, ymin = -.5, ymax = 1, gridlines=ch
```