

Cap.2 Sucesiones y series

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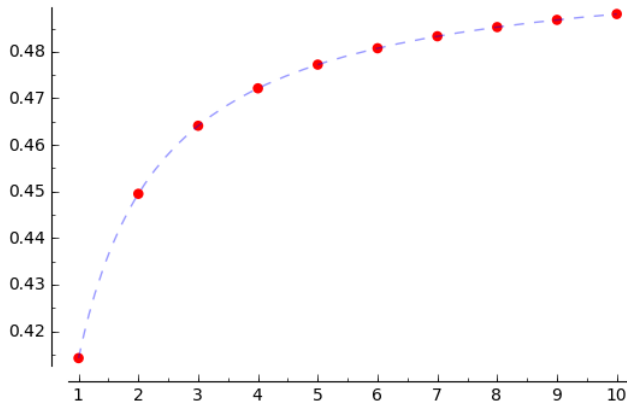
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```
#
# CALCULA TÉRMINOS DE UNA SUCESIÓN Y LOS DIBUJA
#
#-----
var("n")
@interact
def _(f = sqrt(n^2+n)-n, N=int(7)):
    for x in range(1,N+1):
        print 'a_'+str(x)+'=',float(f(x))
    li = [(x,f(x)) for x in range(1,N+1)]
    show( plot(f,1,N,linestyle='--',alpha=0.4)+list_plot(li,rgbcolor=(1,0,0),pointsize=30) )
```

f

N

```
a_1= 0.414213562373
a_2= 0.449489742783
a_3= 0.464101615138
a_4= 0.472135955
a_5= 0.477225575052
a_6= 0.480740698408
a_7= 0.483314773548
a_8= 0.485281374239
a_9= 0.486832980505
a_10= 0.488088481702
```



```
#
# RECURRENCIA DEL PROBLEMA 3
#
#-----
@interact
def _(t2=text_control('Número de iteraciones'), n=int(1)):
    ncif = 15
    a = N(sqrt(2),digits=ncif)
    for k in range(1,n+1):
        print 'a_'+str(k)+'=', a
        a = sqrt(2*a)
```



```
#
# LA SERIE \SUM (-1)^n/n CONVERGE MUY LENTAMENTE
# (problema 14: aceleración de series)
#
#-----
@interact
def _(t2=text_control('Número de términos'), n=int(10)):
    s = 0.0
    sa = 0.0
    saa = 0.0
    signo = 1
    k=1
    while k < n+1:
        s = s+1.0/k
        k = k+1
        s = s-1.0/k
        k = k+1

    if n % 2 <> 0:
        s = s+1.0/(k-1)
        signo = -1

    print '\SUM (-1)^n/n=>\t',s
    print '-----'
    print 'Valor "exacto"\t',N(log(2))

    sa = s + 0.5*signo/(n+1)
    print '-----'
    print 'Suma acelerada"\t',sa

    saa = s + signo*(0.75/(n+1) - 0.25/(n+2))
    print '-----'
    print 'Acel. doble"\t',saa
```

Número de términos

n

\SUM (-1)^n/n=> 0.680803381792694

 Valor "exacto" 0.693147180559945

Suma acelerada" 0.692998503743914

Acel. doble" 0.693143683767142