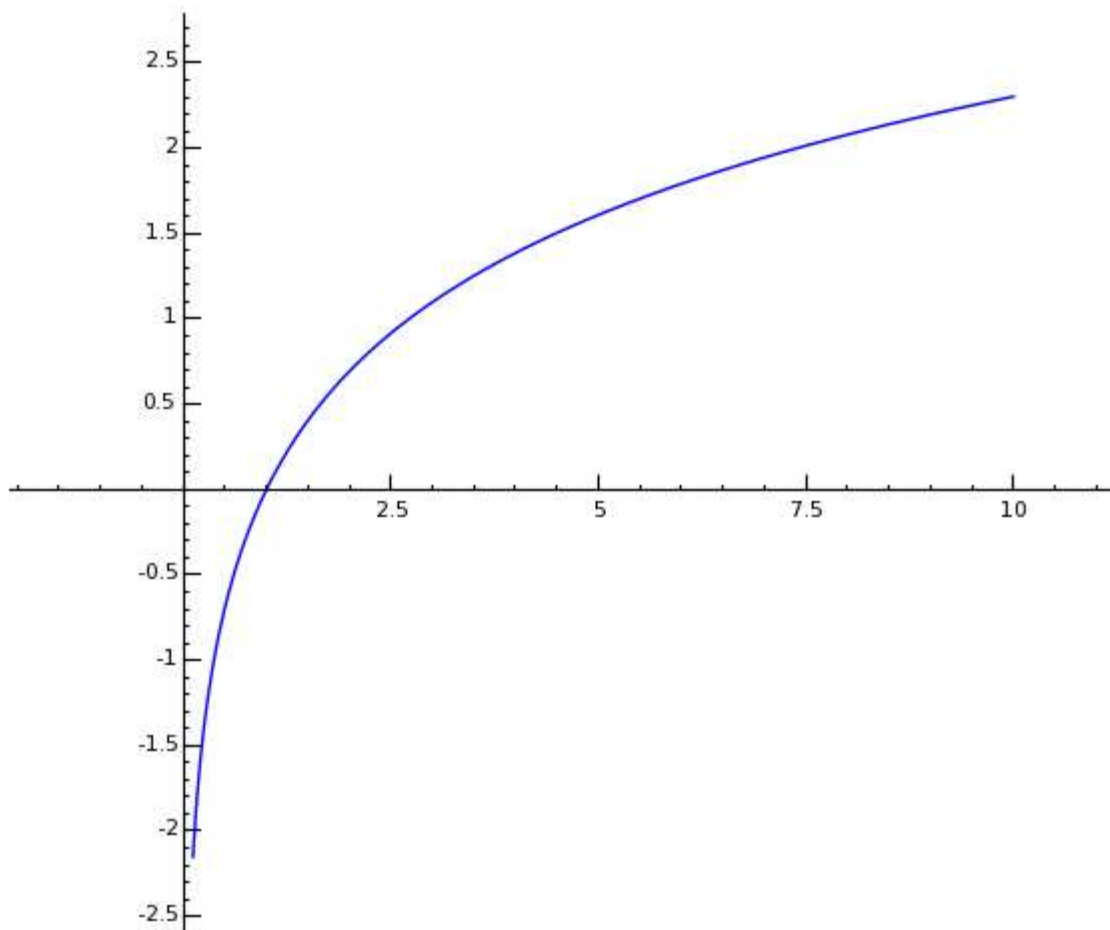
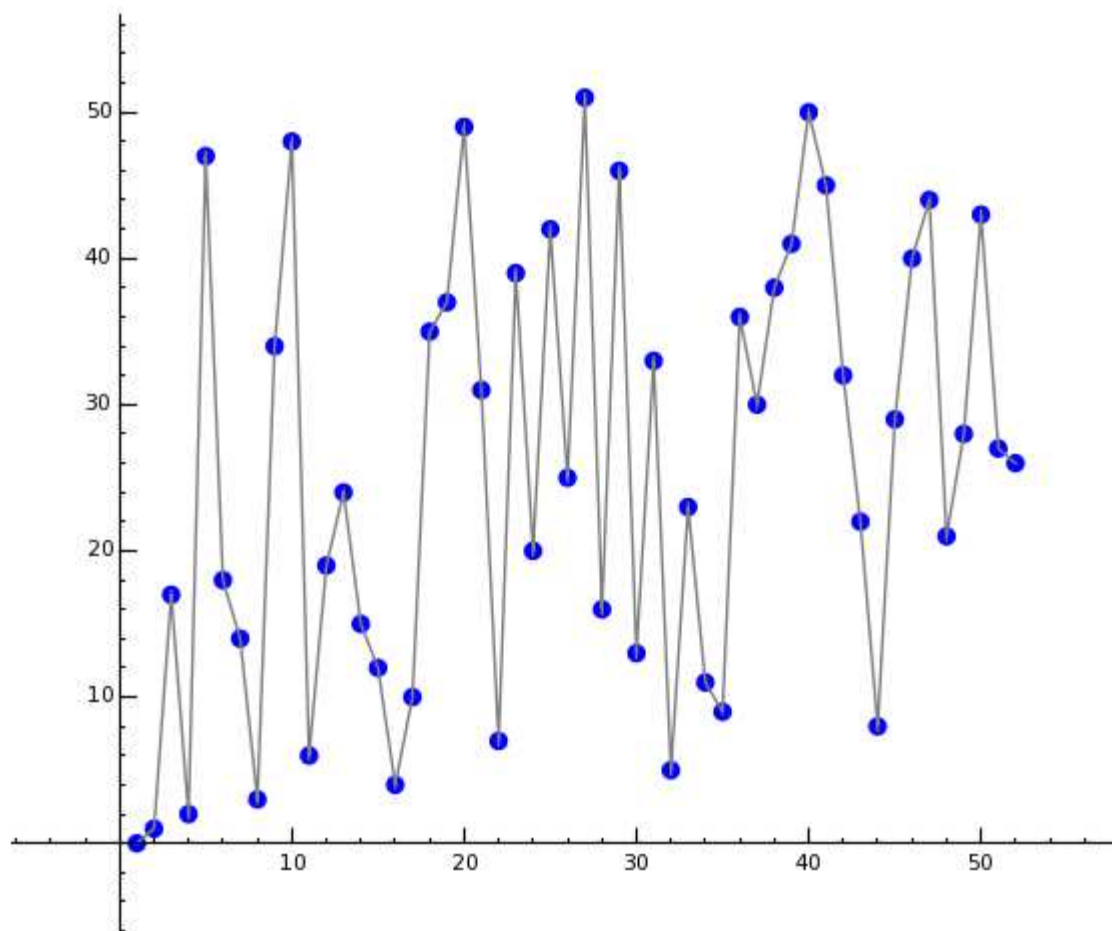


```
log(19683.0)
    9.88751059801299
log(3.0)
    1.09861228866811
log(19683.0) / log(3.0)
    9.00000000000000
show(plot(math.log, 0.1,10, rgbcolor=(0,0,1)))
```



```
p = 53
R = Integers(p)
a = R.multiplicative_generator()
v = [(a^n, n) for n in range(p-1)]
v.sort()
G = plot(point(v,pointsize=50,rgbcolor=(0,0,1)))
H = plot(line(v,rgbcolor=(0.5,0.5,0.5)))
show(G + H)
```



```

q = 93450983094850938450983409623
q.is_prime()
    True
is_prime((q-1)//2)
    True
g = Mod(-2, q)
g.multiplicative_order()
    93450983094850938450983409622
n = 18319922375531859171613379181; m = 82335836243866695680141440300
g^n
    45416776270485369791375944998
g^m
    15048074151770884271824225393
(g^n)^m
    85771409470770521212346739540
(g^m)^n
    85771409470770521212346739540

```

