

```
> restart;
N:=4:
```

$$f1 := x \rightarrow \frac{4}{1+x^2}$$

```
> Midpoint:=proc(N)
local x0,xn,f1,h,S,i,xi,dS;
x0:=0:
xn:=1:
Digits:=20:
f1:=x->4/(1+x^2);
h:=(xn-x0)/N:
S:=0:
for i from 0 to N-1 do
xi:=x0+(i+1/2)*h;
dS:=h*f1(xi);
S:=S+dS;
end do:
evalf(S);
end:
```

```
> ans:=[];
```

```
for i from 1 to 8 do
ans:=[op(ans),i];
end do;
```

```
ans := [ ]
ans := [1]
ans := [1, 2]
ans := [1, 2, 3]
ans := [1, 2, 3, 4]
ans := [1, 2, 3, 4, 5]
ans := [1, 2, 3, 4, 5, 6]
ans := [1, 2, 3, 4, 5, 6, 7]
ans := [1, 2, 3, 4, 5, 6, 7, 8]
```

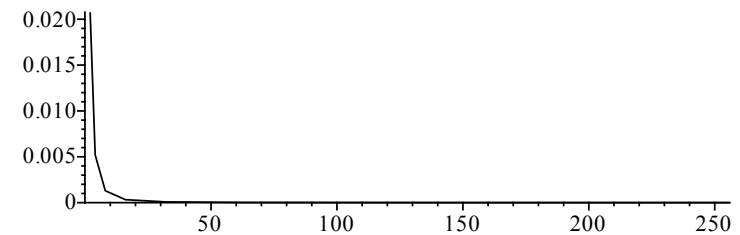
```
> ans:=[];
```

```
for i from 1 to 8 do
ans:=[op(ans),[2^i,evalf(Midpoint(2^i)-Pi)]];
end do:
```

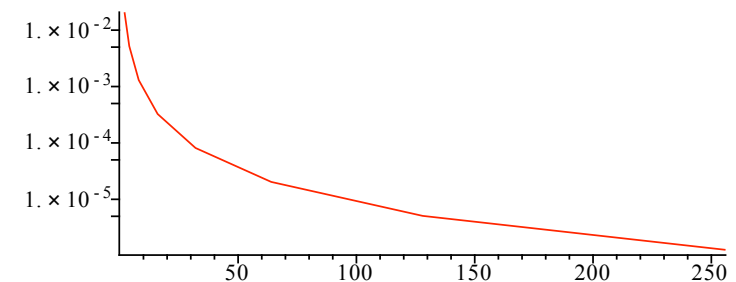
```
ans := [ ]
```

```
> with(plots):
> listplot(ans);
```

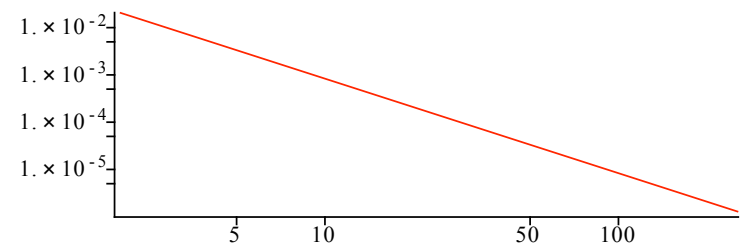
(1)



```
> logplot(ans);
```



```
> loglogplot(ans);
```



(2)

(3)