$f :$
$N \to$
N

$$f(n) = \pi n.$$

$f(0) =$
$3, f(1) =$
$1, f(2) =$
4
$f \in$
1
$\frac{\pi}{4} =$
$2 \arctan(\frac{1}{3}) +$
$\arctan(\frac{1}{7})$

$$\arctan x = \int_0^x \frac{1}{1+t^2} \mathrm{d}t,$$

$k =$ $\frac{1}{1+t^2}{}^2$
n

$$\frac{1}{1+t^2} = \sum_{i=0}^{n} [(-1)^i x^{2i}] + \frac{(-1)^{n+1} x^{2n+2}}{1+x^2}$$

$\arctan x =$
$\sum_{i=0}^{n} (-1)^i \int_0^x t^{2i} \mathrm{d}t +$
$\int_0^x \frac{(-1)^{n+1}}{1+t^2} t^{2n+2} \mathrm{d}t$
$=$
$\sum_{i=0}^{n} (-1)^i \frac{x^{2i+1}}{2i+1} +$
$\int_0^x \frac{(-1)^{n+1}}{1+t^2} t^{2n+2} \mathrm{d}t *$
$n =$
$2k+$
1
$\pi =$
$8 \arctan(\frac{1}{3}) +$
$4 \arctan(\frac{1}{7})$
$=$
$8 \sum_{i=0}^{2k+1} (-1)^i \frac{1}{(2i+1)3^{2i+1}} +$
$8 \int_0^{\frac{1}{3}} \frac{t^{4k+4}}{1+t^2} \mathrm{d}t$
$+$
$4 \sum_{i=0}^{2k+1} (-1)^i \frac{1}{(2i+1)7^{2i+1}} +$
$4 \int_0^{\frac{1}{7}} \frac{t^{4k+4}}{1+t^2} \mathrm{d}t$
$k =$
$8 \sum_{i=0}^{2k+1} (-1)^i \frac{1}{(2i+1)3^{2i+1}} +$
$4 \sum_{i=0}^{2k+1} (-1)^i \frac{1}{(2i+1)7^{2i+1}}$
$r_k =$
$8 \int_0^{\frac{1}{3}} \frac{t^{4k+4}}{1+t^2} \mathrm{d}t +$
$4 \int_0^{\frac{1}{7}} \frac{t^{4k+4}}{1+t^2} \mathrm{d}t$
$8 \int_0^{\frac{1}{3}} t^{4k+4} \mathrm{d}t +$
$4 \int_0^{\frac{1}{7}} t^{4k+4} \mathrm{d}t$
$=$
$8 \cdot$
$\frac{1}{3^{4k+5} \cdot (4k+5)} +$
$4 \cdot$
$\frac{1}{7^{4k+5} \cdot (4k+5)}$
$<$
$8 \cdot$
$\frac{1}{3} \cdot$
$\frac{1}{3^{4k+4}} +$
$4 \cdot$
$\frac{1}{7} \cdot$
$\frac{1}{7^{4k+4}}$ $\frac{1}{3^{4k}}$ $\frac{1}{80^k}$
$\pi =$
$t_k +$
r_k
$0 <$
$r_k <$
$\frac{1}{80^k}$
$t_k k$
$t_k k \pi k$
$10^k t_k <$