

In[]:=



volume of an n dimensional ball



Result

Out[]=

$$\frac{2 \pi^{n/2} r^n}{n \Gamma\left(\frac{n}{2}\right)} \approx \frac{2 \times 3.14159^{0.5 n} r^n}{n \Gamma(0.5 n)}$$

(assuming radius r)

$$B_{n_} := \frac{2 \pi^{n/2} r^n}{n \Gamma\left(\frac{n}{2}\right)}$$

$$\text{In[]} := B_{n_} := \frac{2 \pi^{n/2} (\sqrt{n} - 1)^n}{n \text{Gamma}[n / 2]}$$

$$\text{In[]} := C_{n_} := 4^n$$

$$\text{In[]} := r_{n_} := N[B_{n_} / C_{n_}, 10]$$

$$\text{In[]} := r_5$$

$$\text{In[]} := 0.014832361227929849`$$

Out[]=

0.0148324

$$\text{In[]} := r_{10}$$

Out[]=

0.005433539366

$$\text{In[]} := r_{100}$$

Out[]=

0.00003914448407

$$\text{In[]} := r_{1205}$$

Out[]=

0.9937017977

$$\text{In[]} := r_{1206}$$

Out[]=

1.011581319

$$\text{In[]} := r_{10000}$$

Out[]=

 $7.502427860 \times 10^{95}$