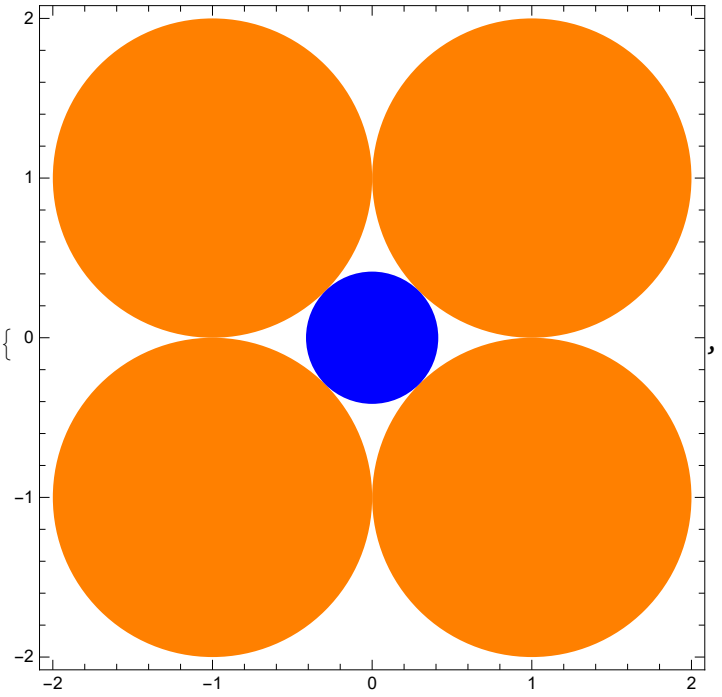
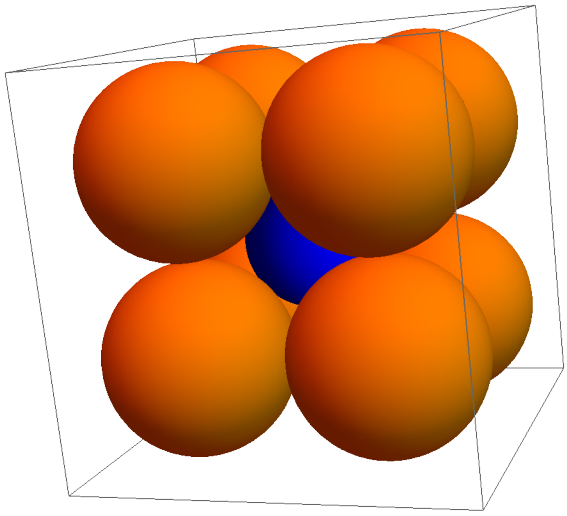
Pensieve header: November 6, 2020: The 1206 Riddle.

```
In[•]:= {Graphics[{Orange, Disk /@ Tuples[{1, -1}, 2], Blue, Disk[{0, 0}, √2 - 1]},
   Frame -> True, ImageSize → 360],
  Graphics3D[{Orange, Ball /@ Tuples[{1, -1}, 3], Blue, Ball[{0, 0, 0}, √3 - 1]},
   ImageSize → 360]}
```

Out[•]=



,



}

In[•]:=

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)

In[•]:=
```
r[n_] := N[(2 π^(n/2) (Sqrt[n] - 1)^n)/((n Gamma[n/2]) 4^n)]
```

In[•]:=
```
Table[r[n], {n, 1, 100}]
```

Out[•]=
```
{0., 0.0336883, 0.0256763, 0.0192766, 0.0148324, 0.0117012, 0.00942996, 0.00773623,
 0.0064424, 0.00543354, 0.00463295, 0.00398795, 0.00346144, 0.00302666, 0.00266395,
 0.00235862, 0.00209949, 0.00187795, 0.00168729, 0.0015222, 0.00137845, 0.00125265,
 0.00114203, 0.00104435, 0.000957722, 0.000880619, 0.000811745, 0.00075002,
 0.000694528, 0.000644493, 0.000599253, 0.000558243, 0.000520974, 0.000487026,
 0.000456033, 0.000427678, 0.000401685, 0.00037781, 0.00035584, 0.000335588,
 0.000316888, 0.000299594, 0.000283573, 0.000268712, 0.000254905, 0.000242061,
 0.000230097, 0.000218937, 0.000208516, 0.000198772, 0.000189652, 0.000181105,
 0.000173087, 0.000165558, 0.000158481, 0.000151822, 0.00014555, 0.000139638,
 0.000134059, 0.000128792, 0.000123813, 0.000119104, 0.000114646, 0.000110423,
 0.000106419, 0.00010262, 0.0000990137, 0.000095587, 0.0000923293, 0.00008923,
 0.0000862796, 0.0000834692, 0.0000807905, 0.0000782359, 0.0000757982, 0.0000734706,
 0.0000712471, 0.0000691218, 0.0000670894, 0.0000651446, 0.0000632829, 0.0000614998,
 0.0000597912, 0.0000581532, 0.0000565821, 0.0000550745, 0.0000536273, 0.0000522374,
 0.000050902, 0.0000496183, 0.000048384, 0.0000471966, 0.000046054, 0.0000449539,
 0.0000438944, 0.0000428737, 0.00004189, 0.0000409416, 0.0000400269, 0.0000391445}
```

In[•]:=
```
ListPlot[Table[r[n], {n, 1., 1200}]]
```

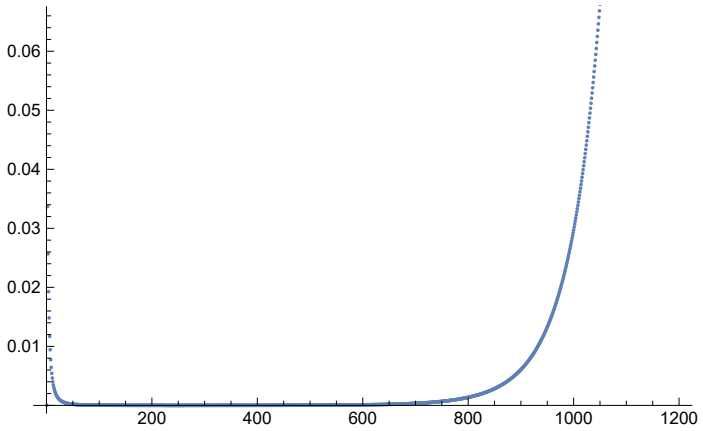
General: $\frac{1}{5.12428\times10^{307}}$ is too small to represent as a normalized machine number; precision may be lost.

General: 1.04624×10^{262} $1.056452658714892\times10^{-324}$ is too small to represent as a normalized machine number; precision may be lost.

General: 2.52279×10^{263} $2.465546437207740\times10^{-326}$ is too small to represent as a normalized machine number; precision may be lost.

General: Further output of General::munfl will be suppressed during this calculation.

Out[•]=



In[•]:=
```
r[1205.]
```

Out[•]=
```
0.993702
```

In[•]:=
```
r[1206.]
```

Out[•]=
```
1.01158
```

In[•]:=
```
ListPlot[Table[Log[r[n]], {n, 1., 2000}]]
```

General: $\frac{1}{5.12428\times10^{307}}$ is too small to represent as a normalized machine number; precision may be lost.

General: 1.04624×10^{262} $1.056452658714892\times10^{-324}$ is too small to represent as a normalized machine number; precision may be lost.

General: 2.52279×10^{263} $2.465546437207740\times10^{-326}$ is too small to represent as a normalized machine number; precision may be lost.

General: Further output of General::munfl will be suppressed during this calculation.

Out[•]=