
Heron of Alexandria

Heron, *Metrica* i, 8, ed. H. Schöne (Heron iii.) 18. 12-24. 21,
in Ivor Thomas, *Greek Mathematical Works*, vol. II, p. 471.

Since 720 has not a rational square root, we shall make a close approximation to the root in this manner. Since the square root nearest to 720 is 729, having a root of 27, divide 27 into 720; the result is $26\frac{2}{3}$; add 27; the result is $53\frac{2}{3}$. Take half of this; the result is $26\frac{2}{3} + \frac{1}{3}$ ($= 26\frac{5}{6}$). Therefore the square root of 720 will be very nearly $26\frac{5}{6}$. For $26\frac{5}{6}$ multiplied by itself gives $720\frac{1}{36}$; so that the difference is $\frac{1}{36}$. If we wish to make the difference less than $\frac{1}{36}$, instead of 729 we shall take the number now found, $720\frac{1}{36}$, and by the same method we shall find an approximation differing by much less than $\frac{1}{36}$.
