In the following

\[(x) = \Gamma\left(\frac{x}{40}\right)\).

\(K[N]\) is the complete elliptic integral of the first kind such that \(K'[N]/K[N] = \sqrt{N}\).

From some old files I have found the following.

\[(1.1)\]

\[
\frac{(1)(9)(13)(17)}{(3)(7)(11)(19)} = \sqrt{5(\sqrt{2} + 1)(\sqrt{10} + 3)} - \frac{5^{1/4}}{\sqrt{2}}(2\sqrt{2} + 1 + \sqrt{5}),
\]

\[
\frac{(1)(3)(11)(13)}{(7)(9)(17)(19)} = \frac{2^{-3/5}(\sqrt{10} + 3)(5 + \sqrt{5} - 2\sqrt{10} + 2\sqrt{(\sqrt{2} - 1)(10\sqrt{2} - 6\sqrt{5})}}{\pi} \times \Gamma(1/5)^2,
\]

\[
\frac{(1)(7)(11)(17)}{(3)(9)(13)(19)} = \frac{2^{-6/5}(\sqrt{10} - 3)(\sqrt{2} + 1)(5 - \sqrt{5} + 2\sqrt{10} + 2\sqrt{15} + \sqrt{5} + 4\sqrt{10})}{\pi} \times \Gamma(2/5)^2,
\]

\[
\frac{(1)(3)(7)(9)}{(11)(13)(17)(19)} = \frac{\left(\sqrt{2} + 1\right)^3(-8 - 3\sqrt{2} - 3\sqrt{5} + 6\sqrt{10} + 2\sqrt{115 - 30\sqrt{2} - 7\sqrt{5} - 18\sqrt{10}})}{\pi} \times 80(\sqrt{10} + 3)K[5]^2,
\]

\[
\frac{(1)(3)(9)(11)(17)(19)}{(7)(13)} = 32\sqrt{5}\pi \left(\sqrt{10} - \sqrt{2} + 2\sqrt{5} + \sqrt{5}\right)K[2]^2,
\]

\[
\frac{(1)(7)(9)(11)(13)(19)}{(3)(17)} = 160\pi(\sqrt{2} - 1)^4 \left(6 + 7\sqrt{2} - 6\sqrt{5} - 3\sqrt{10} + 2\sqrt{115 + 30\sqrt{2} + 7\sqrt{5} - 18\sqrt{10}}\right) \times K[10]^2,
\]

\[
\frac{(1)(9)(17)}{(7)} = 2^{5/4}5^{3/8}\sqrt{\pi(\sqrt{2} - 1)^{1/2}} \left(2 + \sqrt{2}(1 + \sqrt{5}) - 2\sqrt{5} - \sqrt{5}\right)K[2].
\]

(1.1) came from expanding \(\Gamma(1/4)\) in \(\Gamma\) of forty’eths. It should have yielded a result.
containing $K[1]$ but somehow that cancelled out and just a constant was obtained. (1.2) and (1.3) came from turning $\Gamma(1/5)$ and $\Gamma(2/5)$ respectively into $\Gamma$ forty'eths. (1.4) from expanding various $\Gamma$ twenty'eths into forty'eths. (1.5) is from my original evaluation of $K[10]$. I have no idea where (1.7) comes from but it is in my notes and it checks out numerically. By combining the results above in an obvious way one arrives at

$$\frac{(1)(11)}{(9)(19)} = \frac{2^{1/10}(\sqrt{5} + \sqrt{5} + \sqrt{5})}{\pi} \Gamma(1/5)\Gamma(2/5)$$ (1.8)

$$\frac{(1)(9)(11)(19)}{} = 2^{13/25}5^{3/4}(\sqrt{2} - 1)^{5/2}\sqrt{(\sqrt{5} + 2)(2 - \sqrt{5} + 3\sqrt{2})}K[2]K[10]$$ (1.9)

$$\frac{(1)(9)}{(11)(19)} = \frac{4 \cdot 5^{5/8}}{\sqrt{\pi}} \left(6 + 9\sqrt{5} + 4\sqrt{27} + 7\sqrt{5}\right)^{1/4} K[5].$$ (1.10)

From these last three equations it seems we require another result for some new combination of (1),(9),(11) and (19) before we can proceed.