$$with(Optimization);\ k3 := r \to \frac{\mathrm{sqrt}(3)}{2 \cdot \sin\left(\frac{\mathrm{Pi}}{3 \cdot (r+1)}\right)};\ evalf(k3(3))$$

[*ImportMPS, Interactive, LPSolve, LSSolve, Maximize, Minimize, NLPSolve, QPSolve*]

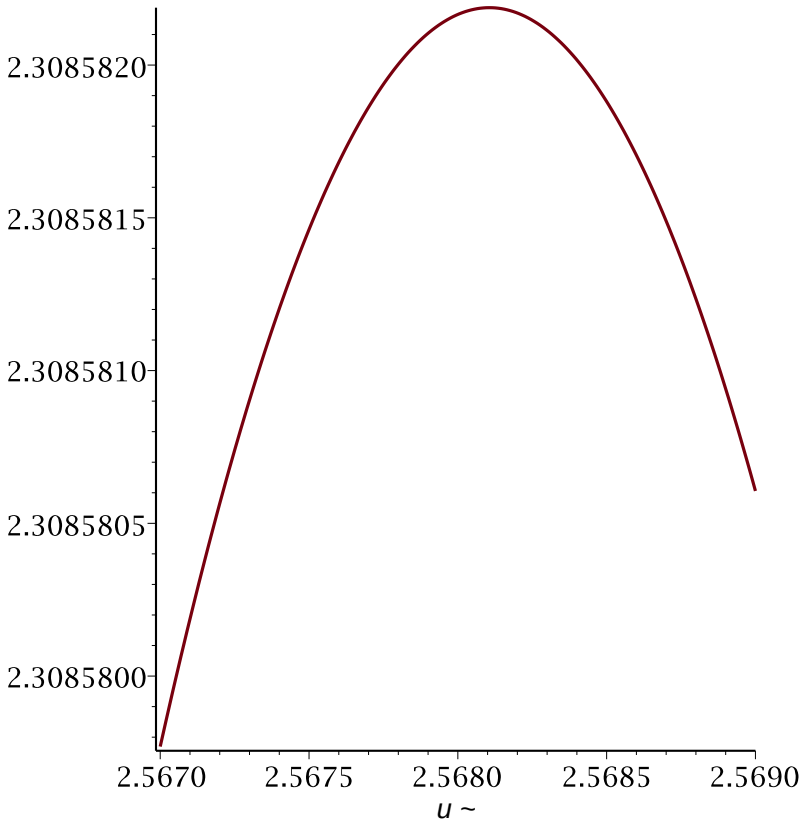
$$r \to \frac{1}{2}\ \frac{\sqrt{3}}{\sin\left(\frac{\pi}{3\,r+3}\right)}$$

$$3.346065216 \tag{1}$$

$$\mathrm{rho} := (u, r) \to \frac{u^{k3(r)-1}}{\mathrm{GAMMA}(k3(r))} \cdot \left(1 - k3(r) \cdot int\left(\frac{1}{t} \cdot \left(1 - \frac{1}{t}\right)^{k3(r)-1}, t = 1..u\right)\right)$$

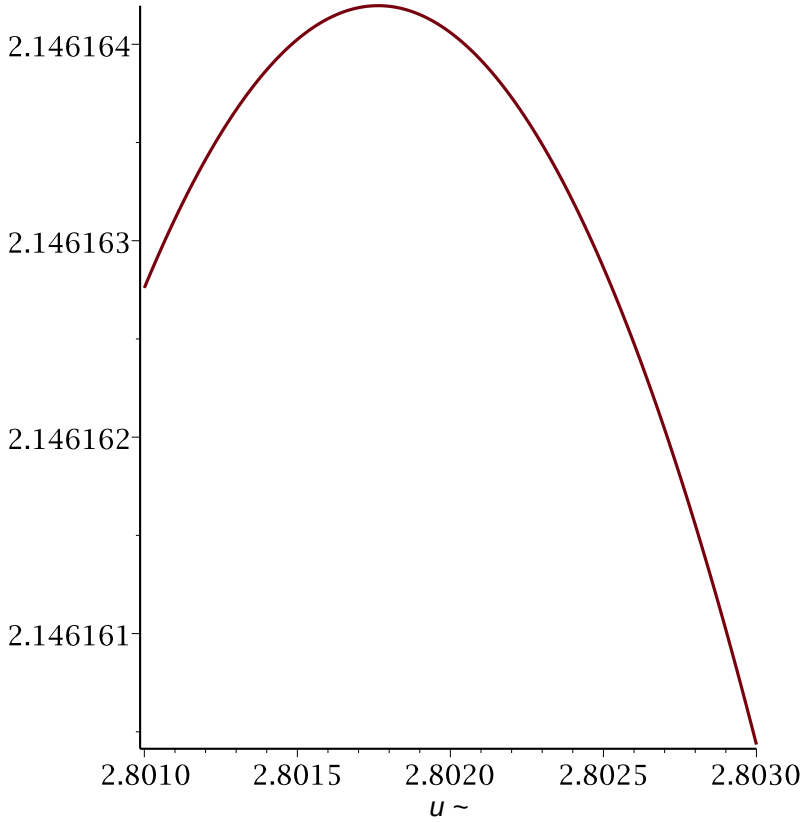
$$(u, r) \to \frac{u^{k3(r)-1}\left(1 - k3(r)\left(\int_1^u \frac{\left(1-\frac{1}{t}\right)^{k3(r)-1}}{t}\,\mathrm{d}t\right)\right)}{\Gamma(k3(r))} \tag{2}$$

$$plot(\mathrm{rho}(u, 3),\ u = 2.567..2.569);\ evalf(\mathrm{rho}(2.568, 3))$$



2.023470588 **(3)**

plot(rho(*u*, 4), *u* = 2.801 ..2.803); *evalf*(rho(2.802, 4))



2.309616544 **(4)**

Digits := 30; *evalf*(*Maximize*(rho(*u*, 3), {$u \geq 2$, $u \leq 3$}))

30

[2.308582187888088191314390503 00, [*u*~ **(5)**
= 2.568105920609409618539568430 08]]

evalf(*Maximize*(rho(*u*, 4), {$u \geq 2$, $u \leq 3$}))

[2.146164196552537677262142514 62, [*u*~ **(6)**
= 2.801764217157500078568426486 91]]