$$\int_{a=-\frac{\pi}{5}}^{b=\frac{\pi}{2}} \cos\left(3x-\frac{\pi}{3}\right)dx \approx -\frac{1}{10}$$

$$R_m^S(f) = \frac{-(b-a)\,h^4}{180} f^{(4)}(\alpha),\ \alpha \in (a,b)$$

$$\frac{|R_m^S(*)|}{10^{-1}} \leq 10^{-8}, \quad h = \frac{7\pi}{10m}$$

$$|R_m^S(*)| \leq 10^{-9}$$

$$f^{(4)}(x) = 81\sin\left(3x+\frac{\pi}{6}\right) \leq 81$$

$$\left|\frac{-\left(\frac{7\pi}{10}\right)^5}{180\cdot m^4}\cdot f^{(4)}(\alpha)\right| \leq \frac{\left(\frac{7\pi}{10}\right)^5}{180\cdot m^4}\cdot 81 \leq 10^{-9}$$

$$\frac{\left(\frac{7\pi}{10}\right)^5\cdot 81}{180\cdot m^4} \leq 10^{-9}$$

$$m \geqslant \sqrt[4]{\frac{\left(\frac{7\pi}{10}\right)^5\cdot 81}{180}\cdot 10^9}$$

$$m = 390$$