

$$\begin{aligned}
 & ctg^2\left(-\frac{\pi}{3}\right) - \frac{1}{2}tg\left(\frac{3\pi}{2} - \frac{\pi}{3}\right) = ctg^2\left(-\frac{\pi}{3}\right) - \frac{1}{2}tg\left(\frac{7\pi}{6}\right) = \\
 & = ctg^2\left(-\frac{\pi}{3}\right) - \frac{1}{2}tg\left(\frac{\pi}{6}\right) = \frac{1}{3} - \frac{1}{2} \cdot \frac{1}{\sqrt{3}} = \frac{2 - \sqrt{3}}{6} > 0, \quad \text{т. к. } 2 > \sqrt{3}
 \end{aligned}$$