

Find $\tan\left(\frac{\pi}{12}\right)$.

$$\tan\left(\frac{\pi}{12}\right) = \tan\left(\frac{4\pi}{12} - \frac{3\pi}{12}\right) = \tan\left(\frac{\pi}{3} - \frac{\pi}{4}\right) = \frac{\tan\left(\frac{\pi}{3}\right) - \tan\left(\frac{\pi}{4}\right)}{1 + \tan\left(\frac{\pi}{3}\right)\tan\left(\frac{\pi}{4}\right)} = \frac{\sqrt{3} - 1}{1 + \sqrt{3}} = \frac{1 - \sqrt{3}}{1 + \sqrt{3}}$$