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$$\sin \frac{5\pi}{12} = \sin \left(\frac{2\pi}{3} - \frac{\pi}{4} \right) = \sin \frac{2\pi}{3} \cos \frac{\pi}{4} - \cos \frac{2\pi}{3} \sin \frac{\pi}{4} = \left(\frac{\sqrt{3}}{2} \right) \left(\frac{\sqrt{2}}{2} \right) - \left(-\frac{1}{2} \right) \left(\frac{\sqrt{2}}{2} \right) = \frac{\sqrt{6} + \sqrt{2}}{4}$$