

Warmup 9: Use the sum or difference formula to find the exact value of  $\sin \frac{13\pi}{12}$ .

↓  
in warmup #5,  
we used  $\frac{\pi}{4} + \frac{5\pi}{6}$ .

$$\sin \frac{13\pi}{12}$$

$$\sin \left( \frac{\pi}{4} + \frac{5\pi}{6} \right)$$

$$\sin (A + B)$$

$$\sin A \cos B + \cos A \sin B$$

$$\sin \frac{\pi}{4} \cos \frac{5\pi}{6} + \cos \frac{\pi}{4} \sin \frac{5\pi}{6}$$

$$\frac{\sqrt{2}}{2} \cdot -\frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2} \cdot \frac{1}{2}$$

$$-\frac{\sqrt{6}}{4} + \frac{\sqrt{2}}{4}$$

$$\boxed{\frac{-\sqrt{6} + \sqrt{2}}{4}}$$

or

$$\boxed{\frac{\sqrt{2} - \sqrt{6}}{4}}$$