

Warmup 2: Use the sum or difference formula to find the exact value of $\sin 255^\circ$.

$$\sin 255^\circ = \sin (135^\circ + 120^\circ)$$

$$\sin (A+B)$$

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

$$\sin 135^\circ \cos 120^\circ + \cos 135^\circ \sin 120^\circ$$

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

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

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

or

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