$$\sin\left(z+\frac{\pi}{2}\right) = \left\{ \sin z = \frac{e^{iz}-e^{-iz}}{2i} \right\} = \frac{e^{i\left(z+\frac{\pi}{2}\right)}-e^{-i\left(z+\frac{\pi}{2}\right)}}{2i} =$$

$$= \frac{e^{iz}\cdot e^{\frac{\pi}{2}i} - e^{-iz}\cdot e^{-\frac{\pi}{2}i}}{2i} = \frac{e^{iz}\cdot\left(\cos\frac{\pi}{2}+i\sin\frac{\pi}{2}\right) -}{2i}$$

$$- \frac{e^{-iz}\cdot\left(\cos\frac{\pi}{2} - i\sin\frac{\pi}{2}\right)}{2i} = \frac{e^{iz}\left(0+i\right)-e^{-iz}\left(0-i\right)}{2i}$$

$$= \frac{ie^{iz}+ie^{-iz}}{2i} = \frac{\cancel{i}\left(e^{iz}+e^{-iz}\right)}{2\cancel{i}} = \cos z$$

$$\sin\left(\frac{\pi}{2}+z\right) = \cos z$$