5.- $j(x) = \ln\left(\frac{1+\cos x}{1-\cos x}\right)$

$$j'(x) = \frac{1-\cos x}{1+\cos x} \cdot \frac{-\sin x(1-\cos x) - (1+\cos x)\sin x}{(1-\cos x)^2} = \frac{-\sin x + \sin x\cos x - \sin x - \sin x\cos x}{(1+\cos x)(1-\cos x)} = \frac{-2\sin x}{1-\cos^2 x} = \frac{-2\sin x}{\sin^2 x} = \frac{-2}{\sin x}$$