Hans W Volkmer* (volkmer@uwm.edu), Department of Mathematical Sciences, University of Wisconsin-Milwaukee, Milwaukee, WI 53201. Instability intervals of the Ince and Hill equations. We investigate the length $L_m$ of the $m$th instability interval of the Hill equation $$(1+\epsilon A(x))y''+\epsilon B(x)y'+(\lambda+\epsilon C(x))y=0$$ with $A(x)$, $B(x)$, $C(x)$ being trigonometric polynomials. The leading term in the expansion of $L_m$ in powers of the perturbation parameter $\epsilon$ is found. The results are extensions of earlier work of Levy and Keller (1963). (Received February 04, 2006)