R L **3.110** Determine whether each system $\mathcal{H}$ given below is BIBO stable.
(a) $\mathcal{H}x(t) = u(t)x(t)$;
(b) $\mathcal{H}x(t) = \ln x(t)$;
(c) $\mathcal{H}x(t) = e^{x(t)}$;
(d) $\mathcal{H}x(t) = e^{t}x(t)$;
(e) $\mathcal{H}x(t) = \cos[x(t)]$;
(f) $\mathcal{H}x(t) = x * x(t)$, where $f * g(t) = \int_{-\infty}^{\infty} f(\tau)g(t-\tau)d\tau$;
(g) $\mathcal{H}x(t) = 3x(3t+3)$;
(h) $\mathcal{H}x(t) = 2x(t)+1$; and
(i) $\mathcal{H}x(t) = \sum_{k=0}^{\infty} x^{k}(t)$.

Short Answer. (a) BIBO stable; (b) not BIBO stable; (c) BIBO stable; (d) not BIBO stable; (e) BIBO stable (if x is real valued or complex valued); (f) not BIBO stable; (g) BIBO stable; (h) BIBO stable; (i) not BIBO stable

