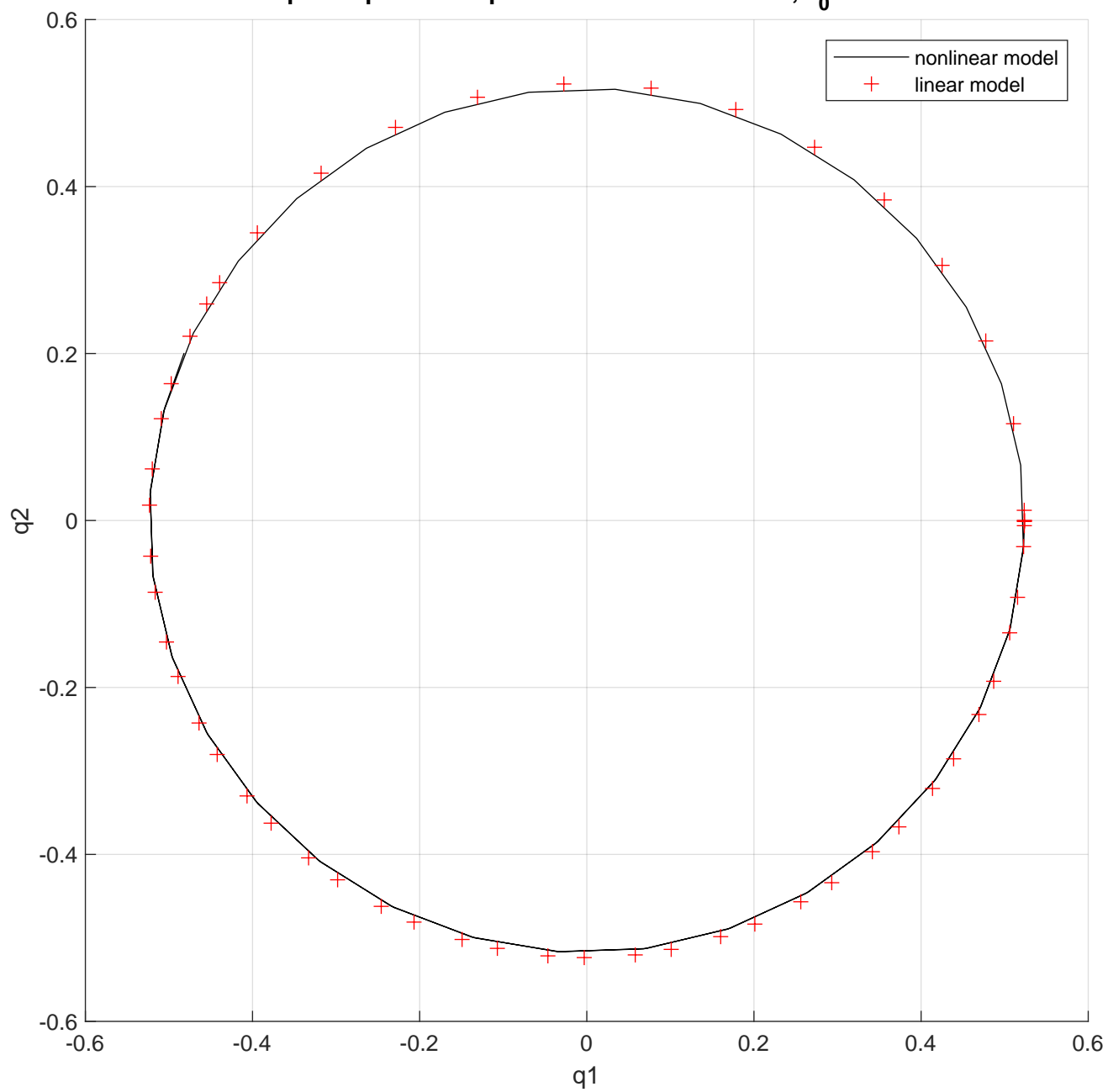
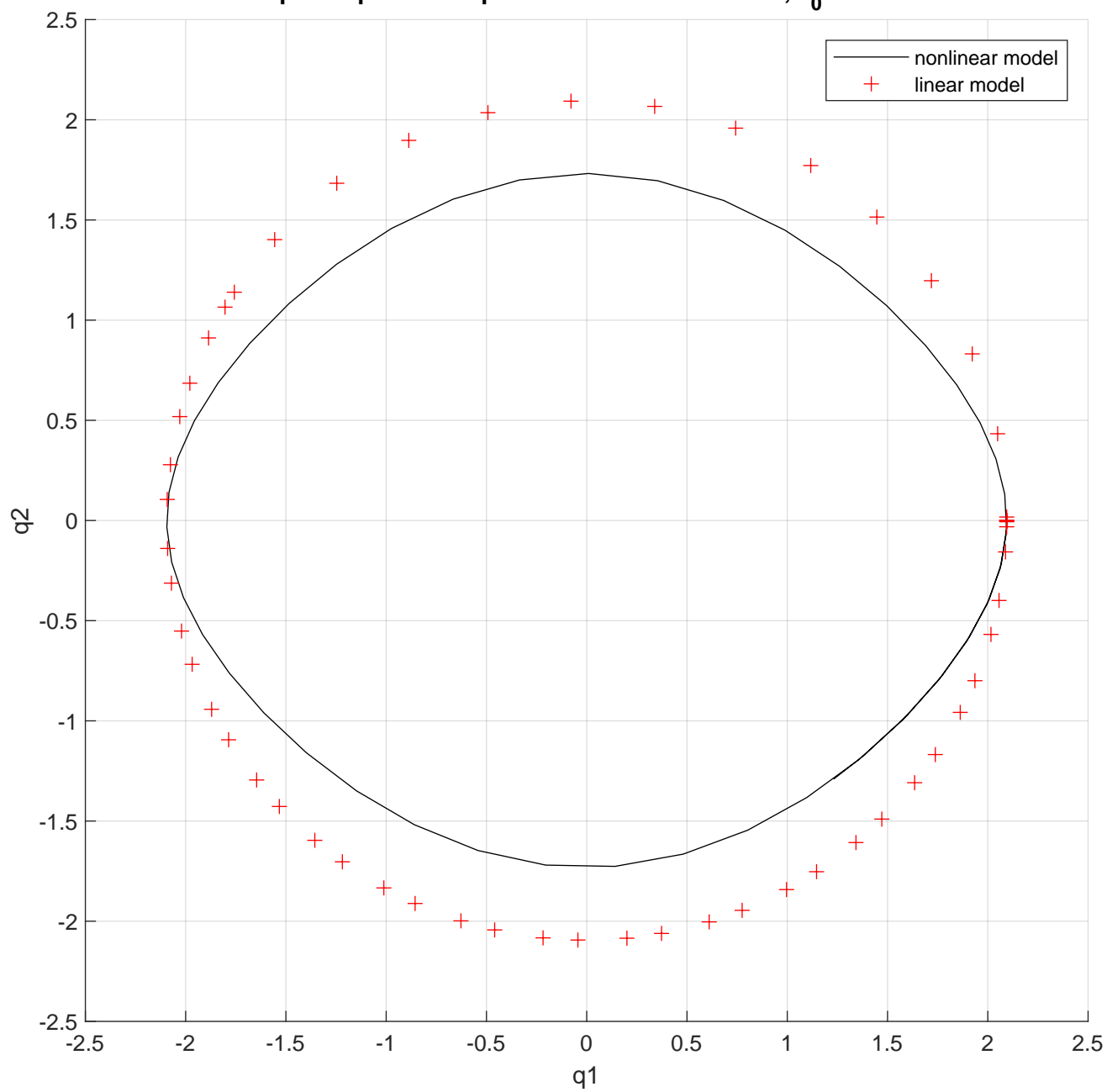
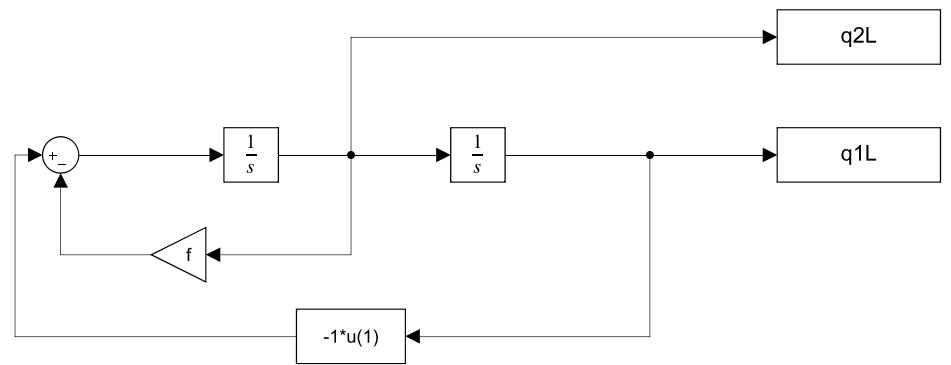
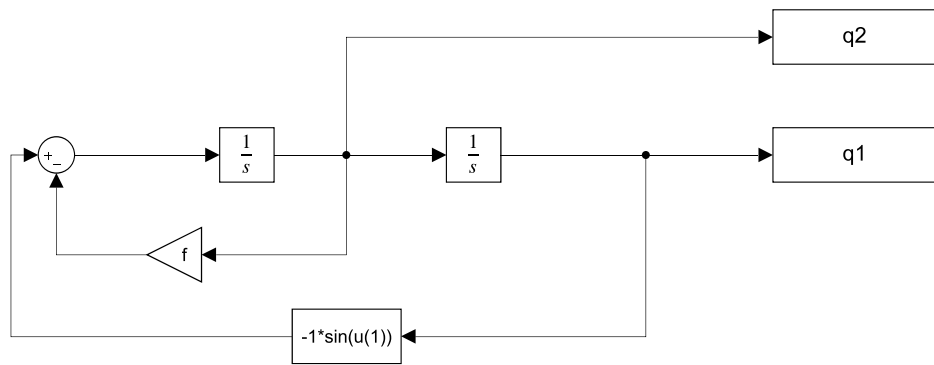


phase portrait of pendulum without friction, $\theta_0=30^\circ$

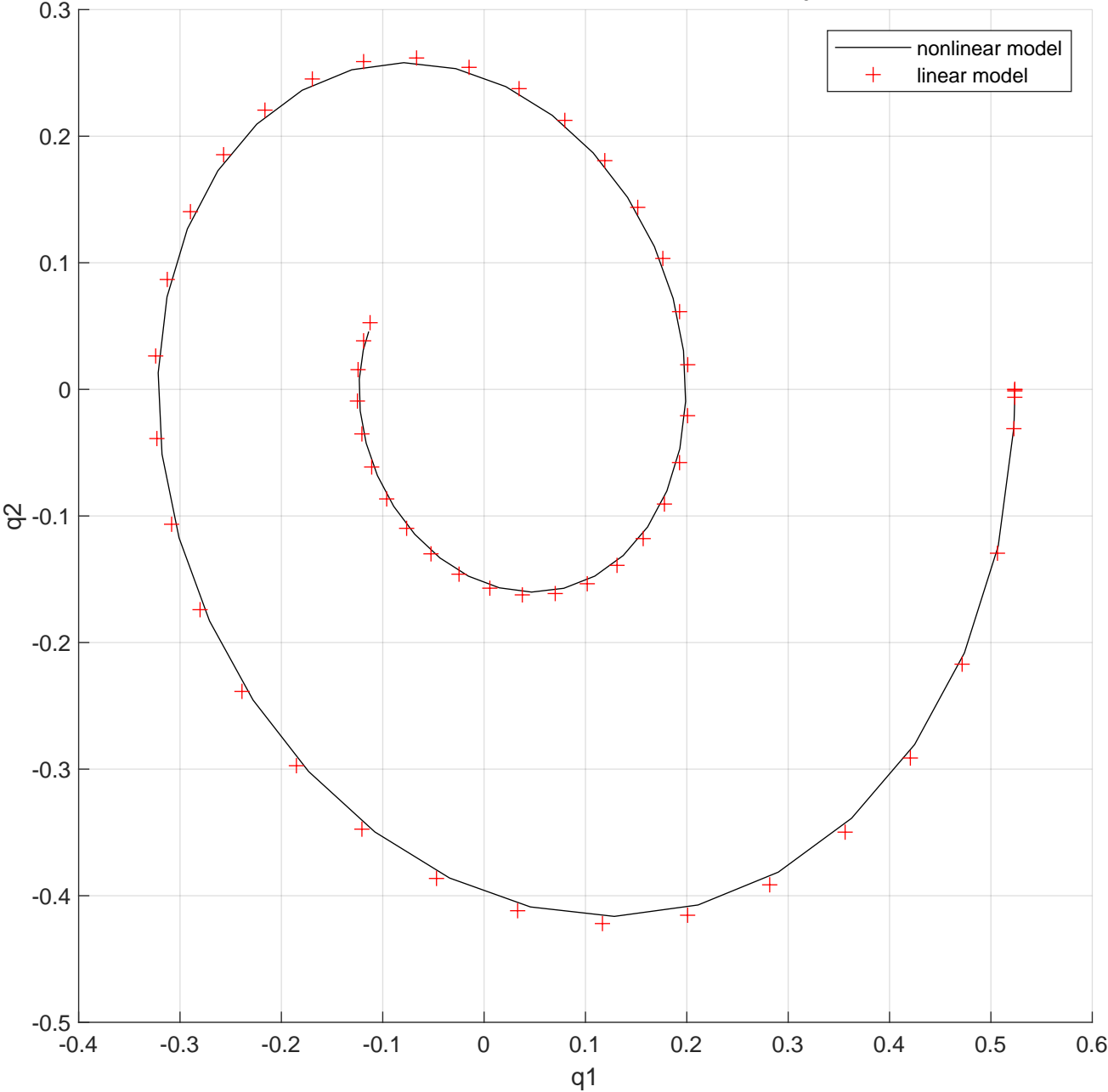


phase portrait of pendulum without friction, $\theta_0=120^\circ$





phase portrait of pendulum with friction, $\theta_0=30^\circ$



phase portrait of pendulum with friction, $\theta_0=120^\circ$

