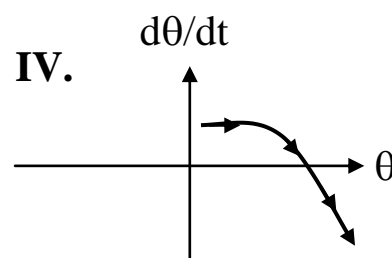
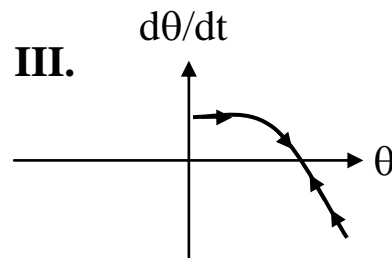
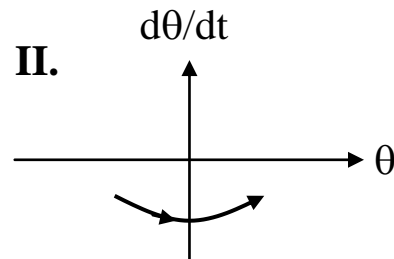
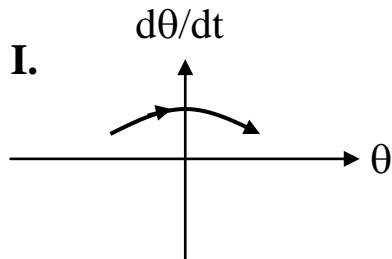
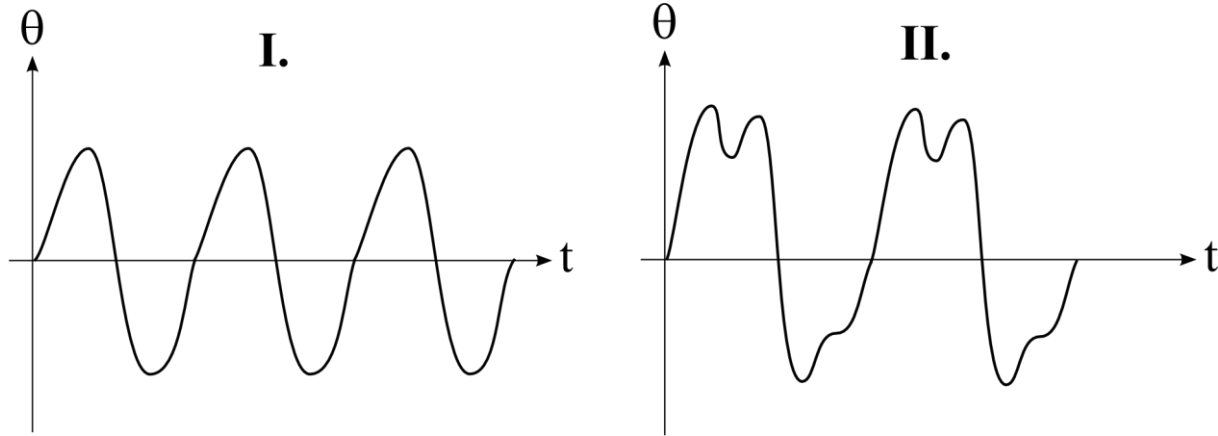


CT10-1. Review of phase diagrams: a pendulum has a phase diagram, which is a plot of $d\theta/dt$ vs θ . Which of the following trajectory portions are physically allowed in the phase diagram of a pendulum?



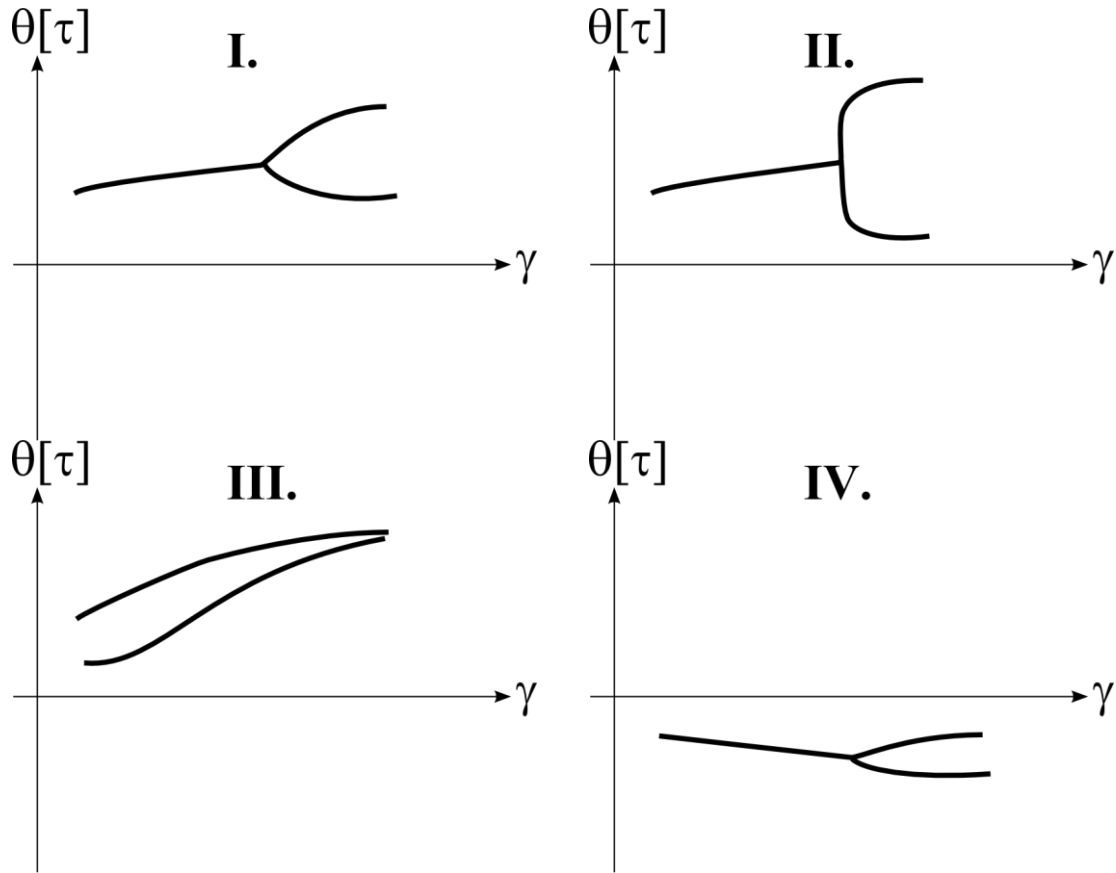
- A) All B) None C) I, II only D) I, III only E) I, III, IV only

CT10-2. Consider the two sketches of angle versus time for a driven, damped pendulum. Which shows a larger driving force amplitude γ ?



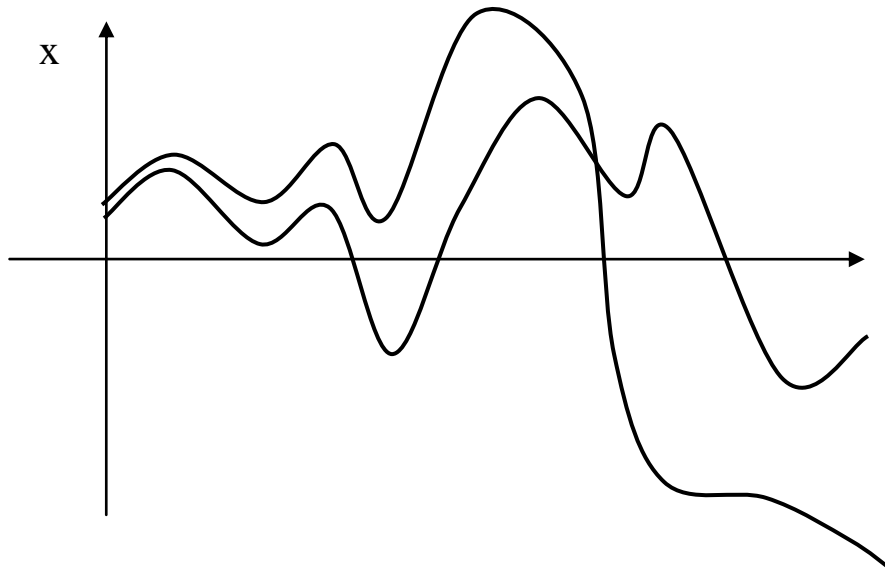
- A) I has a larger driving force than II.
- B) II has a larger driving force I.
- C) I and II have the same driving force.
- D) It cannot be determined from the information given.

CT10-3. Which of the following is a physically possible bifurcation diagram for a driven damped pendulum near the transition from period-1 to period-2 solutions?



- A) None. B) Exactly 1. C) Exactly 2. D) Exactly 3. E) All 4.

CT10-4. What can you say about the Lyapunov exponents of the driven, damped pendulum dynamics with trajectories shown below?



- A) All LEs < 0
- B) All LEs $= 0$
- C) Exactly one LE > 0
- D) At least one LE > 0
- E) All LEs > 0