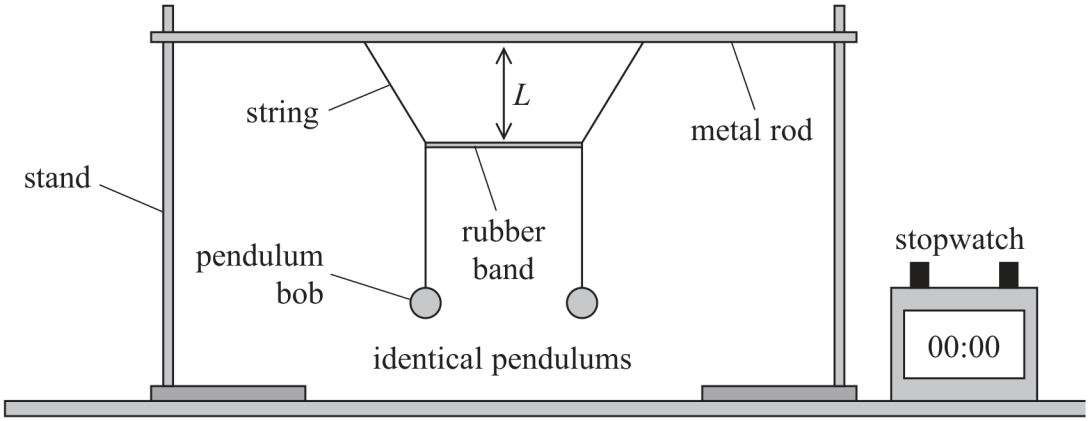
2 Two identical pendulums are linked together using a rubber band as shown.



One pendulum is set in motion. The amplitude of oscillation of this pendulum decreases to zero as the rubber band transfers energy to the other pendulum, which oscillates with increasing amplitude.

Energy is continually transferred between the two pendulums, so their oscillations alternately increase and decrease in amplitude.

(a) The time taken for the amplitude of one pendulum to change from zero to a maximum and back to zero again is P.

It is suggested that the relationship between P and the vertical distance L between the metal rod and the rubber band is

$$P = a\,L^{b}$$

where a and b are constants.

Devise a plan to test the validity of this relationship using a graphical method.

(6)

(b) A student recorded the motion of the pendulums using a video camera.

Suggest how this may improve the measurement of P.

(2)

(Total for Question 2 = 8 marks)