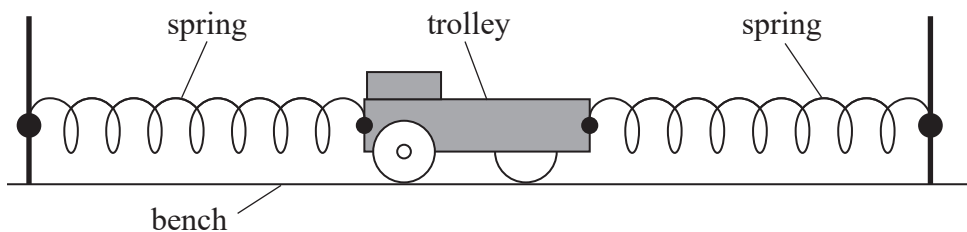


A trolley is attached to the ends of two springs as shown. When displaced from its equilibrium position, the trolley moves with simple harmonic motion.



- (a) A student has a stopwatch and metre rule available.
- (i) Explain the procedure that the student should follow to make an accurate determination of the time period T of the trolley.

(6)

- (ii) Describe how the student should use her value of T to determine the maximum speed of the trolley.

(3)

- (b) Another student suggests that a more accurate value for T could be obtained by using a position sensor and data logger.

Comment on this suggestion.

(1)

- (c) The student displaces the trolley a greater distance from the equilibrium position, so the amplitude of oscillation is doubled. The trolley still moves with simple harmonic motion.

Explain how the maximum kinetic energy of the trolley will change.

(3)

(Total for Question 7 = 13 marks)