

- (d)
- Move the end of the strip with the 100 g masses down through a short distance.
 - Release the end of the strip. The strip will oscillate up and down.
 - Take measurements to determine the period T of these oscillations.

$T = \dots\dots\dots$ [2]

- (e)
- Change the value of b to approximately 20 cm.
 - Adjust the heights of the bosses until the strip is horizontal and the spring and string loop are vertical.
 - Measure and record b .

$b = \dots\dots\dots$

- Repeat (c)(ii) and (d).

$\alpha = \dots\dots\dots$

$T = \dots\dots\dots$
[2]

(f) It is suggested that the relationship between T and α is

$$T = \frac{C}{\alpha}$$

where C is a constant.

(i) Using your data, calculate two values of C .

first value of $C = \dots\dots\dots$

second value of $C = \dots\dots\dots$

[1]

(ii) Explain whether your results support the suggested relationship.

.....

[1]

(g) Theory suggests that

$$C = 2\pi\sqrt{\frac{3m}{k}}$$

where m is 0.100 kg and k is the spring constant of the spring.

Use your second value of C to determine a value for k . Give an appropriate unit.

$k = \dots\dots\dots$ [1]



(h) (i) Describe four sources of uncertainty or limitations of the procedure for this experiment.

- 1.
.....
 - 2.
.....
 - 3.
.....
 - 4.
.....
- [4]

(ii) Describe four improvements that could be made to this experiment. You may suggest the use of other apparatus or different procedures.

- 1.
.....
 - 2.
.....
 - 3.
.....
 - 4.
.....
- [4]

[Total: 20]

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