A student plans to carry out an experiment using a sonometer to determine the frequency (f) of a tuning fork.

(a) Where should he place the sounded tuning fork in order to obtain resonance?

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(b) What procedure must he follow in order to obtain the **fundamental** resonance length?

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(c) The student measured the fundamental resonance lengths (l) corresponding to different tensions of the sonometer wire using different weights (Mg). Write down an expression relating M, l, f and the mass per unit length m of the sonometer wire.

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(d) (i) Which of his experimental 'l' values is considered to have the highest accuracy?

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(ii) Give the reason.

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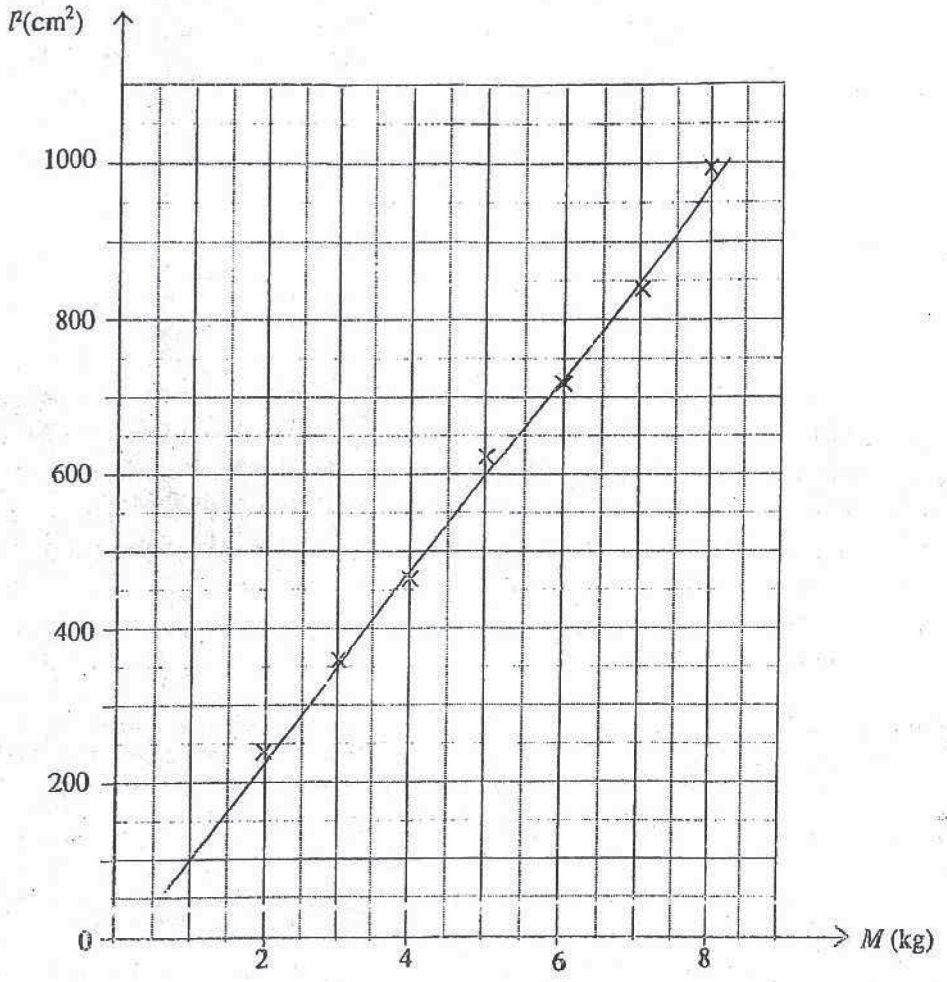
(e) In this experiment the graph plotted by the student is shown in the figure.



(i) Mark with arrows, two **suitable** points on the graph, which you would use to find its gradient .

(ii) Find the gradient of the graph.

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(f) If the value of m is $8\times10^{-4}\,\mathrm{kg\,m^{-1}}$, find the frequency of the tuning fork.

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