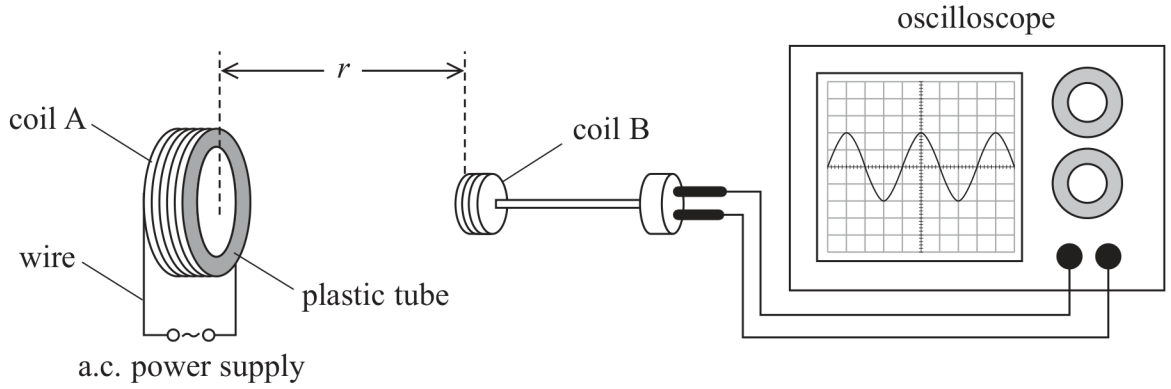
Answer ALL questions.

1 A student investigated the magnetic field produced by a current-carrying coil, coil A.

She made coil A by wrapping a wire around a plastic tube. Coil A was connected to an alternating current (a.c.) power supply.

A second coil, coil B, was placed in the magnetic field and connected to an oscilloscope as shown.



(a) Describe one safety issue and how it should be dealt with.

(2)

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(b) The distance *r* between the two coils varied between 2 cm and 10 cm.

Explain why using Vernier calipers would be better than a metre rule to measure *r*.

You should include calculations in your answer.

(3)

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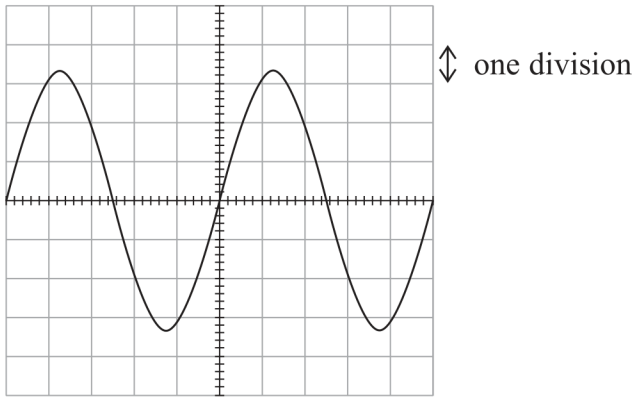
(c) When the a.c. power supply was switched on, an e.m.f. E was induced across coil B. The variation in E is shown on the oscilloscope screen below.



The y-scale was set to 100 mV per division.

Describe how an accurate maximum value for E can be determined from the oscilloscope screen.

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(d) The student measured values of r with Vernier calipers and determined corresponding maximum values of E.

The student's values are shown in the table.

r / cm	2	4	6	8
E / V	320	40	11.9	5

Criticise the recording of this data.

(2)

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(Total for Question 1 = 10 marks)