6 An alternating current supply is connected in series with a resistor R, as shown in Fig. 6.1.

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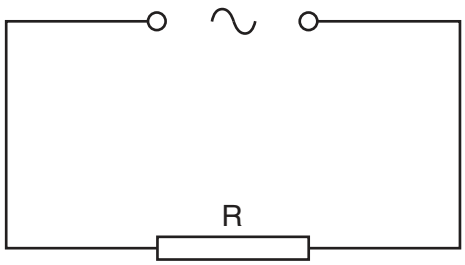

Fig. 6.1

The variation with time t (measured in seconds) of the current I (measured in amps) in the resistor is given by the expression

$$I = 9.9\sin(380t).$$

(a) For the current in the resistor R, determine

(i) the frequency,

frequency = ... Hz [2]

(ii) the r.m.s. current.

r.m.s. current = ... A [2]

(b) To prevent over-heating, the mean power dissipated in resistor R must not exceed 400 W.
Calculate the minimum resistance of R.

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resistance = ... Ω [2]