4 **(a)** A 12 V, 50 W immersion heater is used to heat 0.15 kg of water in a beaker. The water is initially at a room temperature of 20 °C. The specific heat capacity of water is 4200 J / (kg °C).

Calculate the energy supplied to raise the temperature of the water from 20 °C to 58 °C.

energy = ... [3]

(b) The immersion heater is removed from the beaker.

One metal rod and one plastic rod are placed in the beaker of hot water as shown in Fig. 4.1. The rods are at room temperature (20 °C) before they are placed into the beaker.

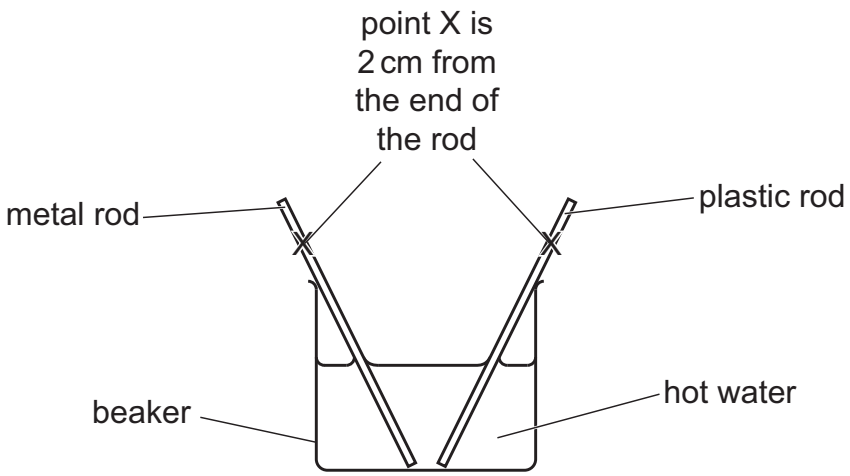

Fig. 4.1

Describe how the temperature of point X on each rod changes after the rods are placed in the beaker. Explain your answer.

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..... [4]

[Total: 7]