Reading Heat Through Two Insulating Layers

Scoring guide · one credit per question · review written work against each rubric

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Question 1

Choice (2)

Layer Q has the larger resistance. With the same rate through both, it has the larger temperature drop.

Question 2

The two layer drops add to 60 − 20 = 40 °C. Their resistances add to 8 °C/W. Dividing 40 by 8 gives 5 W.

Question 3

The drop through P is 5 × 2 = 10 °C, so the first boundary is 60 − 10 = 50 °C. The drop through Q is 5 × 6 = 30 °C, so the second boundary is 60 − 30 = 30 °C.

Question 4

Both builds have the same total resistance of 8 °C/W and the same 40 °C overall difference. Each transfers 5 J/s. The boundary temperature changes because the layer nearest the hot face has a different resistance.