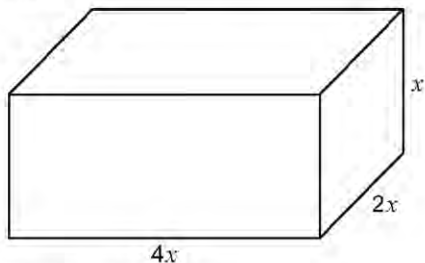


11 A block of ice is melting.

At time t minutes, the block is in the shape of a cuboid with dimensions of $4x$, $2x$ and x , as shown in the diagram.



All measurements are in centimetres.

11 (a) The volume, $V \text{ cm}^3$, of the block of ice **decreases** at a rate which is proportional to its surface area.

When $x = 4$ the volume of the block of ice is decreasing at a rate of 7 cm^3 per minute.

Show that

$$\frac{dV}{dt} = -0.4375x^2 \quad [4 \text{ marks}]$$

11 (b) Find $\frac{dV}{dx}$ in terms of x [2 marks]

11 (c) (i) Using the results from parts (a) and (b), find $\frac{dx}{dt}$ [2 marks]

11 (c) (ii) Interpret, in context, your answer to part (c)(i). [2 marks]