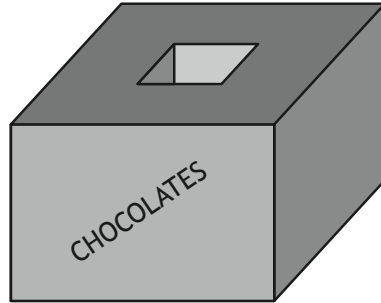
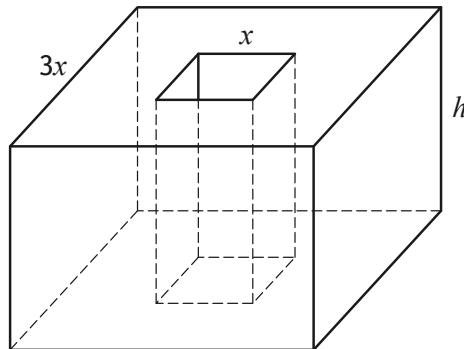


11. A manufacturer of chocolates is launching a new product in novelty shaped cardboard boxes.



The box is a cuboid with a cuboid shaped tunnel through it.

- The height of the box is h centimetres
- The top of the box is a square of side $3x$ centimetres
- The end of the tunnel is a square of side x centimetres
- The volume of the box is 2000 cm^3



- (a) Show that the total surface area, $A \text{ cm}^2$, of the box is given by

$$A = 16x^2 + \frac{4000}{x}.$$

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- (b) To minimise the cost of production, the surface area, A , of the box should be as small as possible.

Find the minimum value of A .

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