

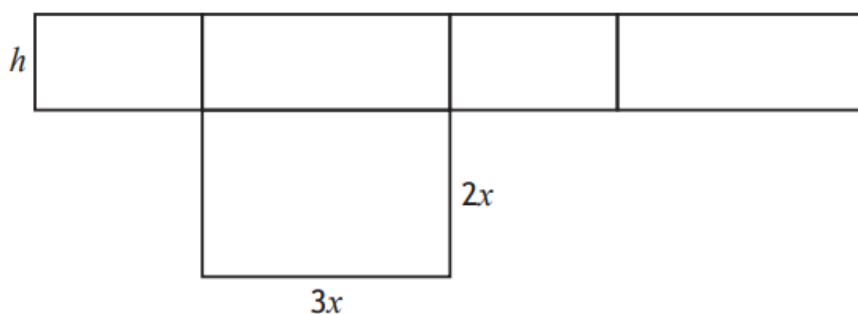
Higher Maths  
SQA 2023 Paper 2  
Question 14



A net of an open box is shown.

The box is a cuboid with height  $h$  centimetres.

The base is a rectangle measuring  $3x$  centimetres by  $2x$  centimetres.



- (a) (i) Express the area of the net,  $A \text{ cm}^2$ , in terms of  $h$  and  $x$ . 1
- (ii) Given that  $A = 7200 \text{ cm}^2$ , show that the volume of the box,  $V \text{ cm}^3$ , is given  
by  $V = 4320x - \frac{18}{5}x^3$ . 2
- (b) Determine the value of  $x$  that maximises the volume of the box. 4

Answers:

- (a) (i)  $6x^2 + 10xh$
- (ii) Express  $h$  in terms of  $x$ . Substitute and demonstrate the result.
- (b) 20