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A cuboid has a square cross-section, shown shaded in the diagram.

The length of the cuboid is x cm.

The sum of the length of the cuboid and one of the sides of the square is 10 cm.

(a) Show that the volume of the cuboid, $y \text{ cm}^3$, is given by $y = x^3 - 20x^2 + 100x$.

[2]

111

(b) The table shows some values of x and the corresponding values of y for

$$y = x^3 - 20x^2 + 100x.$$

x	1	2	3	4	5	6	7	8	9
31	81	128	147	144	125	96		TT T	9

- (i) Complete the table.
- (ii) On the grid opposite, plot the graph of $y = x^3 20x^2 + 100x$ for $1 \le x \le 9$. [3]
- (c) Use your graph to find
 - (i) the maximum volume of the cuboid,

(ii) the possible values of x when the volume of the cuboid is 120 cm³.

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