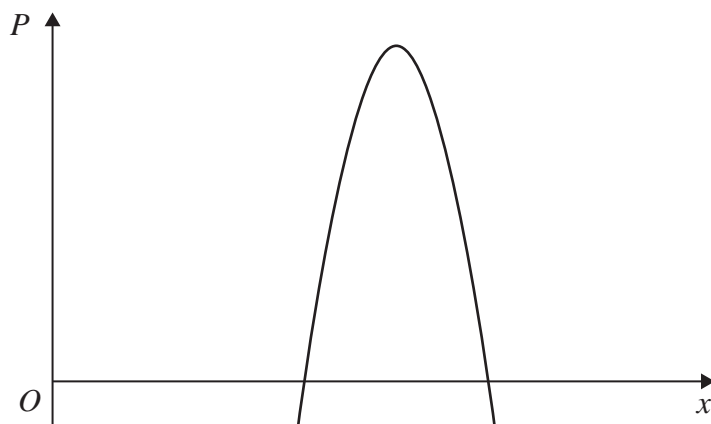**7.**

Figure 3

A company makes a particular type of chair.

The annual profit made by the company is modelled by the equation

$$P = -x^2 + 260x - 16450$$

where P is the profit measured in **thousands** of pounds and x is the selling price of the chair in pounds.

The graph of P against x is shown in Figure 3.

Using the model,

(a) explain why £175 is not a sensible selling price for the chair.

(2)

Given that the company made an annual profit of more than £200 000

(b) find, according to the model, the highest possible selling price for the chair.

You must show your working clearly.

(3)

(c) Show that

$$P = a + b(x + c)^2$$

where a, b and c are constants to be found.

(3)

The company wishes to maximise its annual profit.

State, according to the model,

(d) (i) the maximum possible annual profit,

(ii) the selling price of the chair that maximises the annual profit.

(2)