

7. A small factory makes bars of soap.

On any day, the total cost to the factory, $\pounds y$, of making x bars of soap is modelled to be the sum of two separate elements:

- a fixed cost
- a cost that is proportional to the number of bars of soap that are made that day

(a) Write down a general equation linking y with x , for this model.

(1)

The bars of soap are sold for $\pounds 2$ each.

On a day when 800 bars of soap are made and sold, the factory makes a profit of $\pounds 500$

On a day when 300 bars of soap are made and sold, the factory makes a loss of $\pounds 80$

Using the above information,

(b) show that $y = 0.84x + 428$

(3)

(c) With reference to the model, interpret the significance of the value 0.84 in the equation.

(1)

Assuming that each bar of soap is sold on the day it is made,

(d) find the least number of bars of soap that must be made on any given day for the factory to make a profit that day.

(2)