RSC | Advancing the Chemical Sciences

Cost Equation Calculation Example

A company sells a commodity chemical and all costs may be allocated to one of two categories, variable and fixed, as denoted by ***V*** and ***F*** respectively (£ week^{-1}). The average raw materials and processing cost, ***v*** (£ t^{-1}), associated with the process may be described by the equation:

$$v = 400 - 0.25x$$

and the overhead costs ***F*** (£ week^{-1}) may be described by the equation:

$$F = 5000 + x^2$$ where x = quantity produced (t week^{-1})

(a) Derive mathematically the total cost equation as a function of the output.

(b) Given that the price of the commodity is £550 t^{-1} calculate:

(i) the upper and lower break even points

(ii) the output level at which the profit margin is greatest (Hint: profit margin means the production quantity where the gap between price and costs is at a maximum)

(iii) the value of the maximum profit margin

(c) Calculate the output level at which the total profit is maximised and hence determine the maximum total profit.