

GRAPH PROBLEMS

1)

(a) The quantity (y thousand) of an article which a firm is prepared to manufacture depends on the price (x) at which it will be able to sell the article, according to the formula $y = 14 - \frac{12}{x-2}$

Draw the graph of this equation for $3 \leq x \leq 8$, taking a scale of 2cm to 1 unit on the x -axis, and 1 cm to 1 unit on the y -axis.

(b) There is a limit beyond which the firm's production would never go, whatever the price of the article. What is this limit? (Hint: what is the production level if the price is 100 ? 1000?)

(c) The quantity (y thousand) of the article which the public are prepared to buy depends on the price according to the formula $y = 18 - 2x$. Draw the graph of this equation on the same axes.

(d) What is the equilibrium price of the product (ie. the price at which the firm will be able to sell all the articles it produces)?

2)

(a) When a firm manufactures x thousand of a certain article per week, the revenue produced (R thousand) is given by the formula $R = \frac{5x}{x+1}$.

Draw the graph of this equation for $0 \leq x \leq 9$. Take 2cm to one unit on each axis.

(b) There is a limit beyond which the firm's revenue will never go, no matter how much it increases production. What is that limit?

(c) The costs (C thousand) of manufacturing x thousand articles are given by the formula $C = 0.5x + 1$. Draw the graph of this equation on the same axes.

(d) If production is 4000 articles per week, find the firm's revenue per week, and the costs per week. What is the firm's profit per week?

(e) From your graph, estimate between what limits x must lie in order for the firm to make a profit.

(f) Estimate also the production level which gives the maximum profit level, and the size of this profit.