

8.1 Applications of Polynomials

Ex 1 a. John owns an insurance firm. He employs staff to sell insurance policies to people. He finds that if he employs x staff (at a cost of \$750 per week per staff member) then he sells y policies where:

$$y = x^3 - 12x^2 + 60x$$

Because of space considerations, he cannot hire more than 7 staff members. He also has \$2500 per week in fixed costs. If the firm receives \$50 for every policy sold, how many staff should he hire in order to have a profit of \$200?

b. What range of employees guarantee a positive amount of profit?

Ex 2 A small manufacturing company models the total cost, $C(x)$, in dollars, of producing x units of a certain specialized item using a cubic function. They have observed the following:

The fixed cost (cost to produce 0 units) is \$50. When 1 unit is produced, the total cost is \$114. When 2 units are produced, the total cost is \$258. When 3 units are produced, the total cost is \$502. Assuming the cost function is cubic, determine the cost function for this company.

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