1. Let \( f(x) = x^5 \).
   (a) Find the equation of the tangent line to \( y = f(x) \) at \( x = 2 \).
   (b) Use the tangent line to \( f \) at \( x = 2 \) to approximate \( (1.97)^5 \).

2. Let \( f(x) = 1/x \).
   (a) Find the equation of the tangent line to \( y = f(x) \) at \( x = 10 \).
   (b) Use the tangent line to \( f \) at \( x = 10 \) to approximate \( \frac{1}{10.1} \).

3. Find the intervals of increase and decrease of \( f(x) = x^4 - 4x^3 + 4x^2 \), as well as all local extreme values.

4. Sketch the graph of the function \( g(x) = x^3 - 6x^2 - 15x + 10 \).

5. A liquid form of penicillin manufactured by a pharmaceutical firm is sold in bulk at a price of $200 per unit. If the total production cost (in dollars) for \( x \) units is \( C(x) = 500,000 + 80x + .003x^2 \) and if the production capacity of the firm is at most 30,000 units in a specified time, how many units of penicillin must be manufactured and sold in that time to maximize the profit?