Session 3 : Introduction to differentiation
Outline

- Slope of a curve
- Optimization
Part 1:
Slope of a curve
What is the slope at \( x = x_0 \)?
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The profit of your company is approximated by the following function:

\[ f(x) = -x^3 + 40x^2, \]

where \( x \) stands for the quantity of units produced. What is the effect of slightly increasing your production when you already produce 10 units? When you produce 30 units?
Part 2: Optimization
Application

It costs to an automobile company 8000 euros to produce each car, and fixed costs are 20000 per week. The company’s price function is \( p(x) = 22000 - 70x \), where \( p \) is the price at which exactly \( x \) cars will be sold.

- How many cars should be produced each week?
- For what price should they be sold?
- What is the company’s maximum profit?