1. Given:
   $x^2y + y^3 = 10$
   $Find\ dy/dx$
2. Given:
   $$x(t) = t^2 - 4,\ \ y(t) = t^3 - 3t$$
   At what value(s) of t does the curve have a **horizontal tangent**?
3. Given the curve:
   $y = x^3$
   Find the **slope of the normal line** at $x = 2$.
4. The population of a city is modeled by the function:
   $$P(t) = 5000e^{0.02t}$$
   where P is the population and t is time in years. What is the **rate of population growth** at t=10 years?
5. Let $f(x) = x^3 - 3x^2 + 2$.
   What are the **critical points**, and where does $f(x)$ have a **local maximum**?