1. State the Intermediate Value Theorem.

2. State the Mean Value Theorem.

3. Consider \( f(x) = x^3 - 2x^2 - 9x + 23 \). Using the Mean Value Theorem, explain why you know there must be a maximum, a minimum or a stationary point in the interval \([2,3]\).

4. If \( z^2 = x^2 + y^2 \), \( \frac{dx}{dt} = 2 \), and \( \frac{dy}{dt} = 3 \), find \( \frac{dz}{dt} \) when \( x = 5 \) and \( y = 12 \).