Lecture 16 Activity: Maximum and Minimum Values

Ben Logsdon
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1. Find the local extrema of the function $f(x) = x^3 - 12x^2 + 45x - 1$ and the x-coordinates at which they occur.

2. Find the critical point(s) of the function $f(x) = ax^2 + bx + c$ when $a \neq 0$. What does this tell you about the graph of f?

3. Find the global extrema of the function $f(x) = xe^{2x}$ on the interval $[-1, 0]$.

4. Find the critical point(s) of the function $f(x) = ax^3 + bx^2 + cx + d$ when $a \neq 0$. What does this tell you about the graph of f?

5. **Challenge problem:** The acceleration due to gravity on Earth is about -9.8m/sec^2. Suppose that I throw a ball straight upward. I release the ball from my hand at precisely 1.5 m above ground level at a speed of 5m/sec. How high will the ball travel?