Using the Derivative: Minima and Maxima

1. Analyze the following function. Find and classify all critical points. Find all inflection points. Determine any local maxima or minima (x and y values). Sketch the function.

$$g(x) = -x^2 + 6x - 5 \ . \tag{1}$$

2. Suppose you can chose any two numbers, so long as they add up to 8. What should those two numbers be to make their product is as large as possible?