1. Sketch the graph of $f(x) = 6xe^{-0.5x}$. On which interval is $f(x)$ increasing? On which interval is $f(x)$ decreasing?
2. Sketch the graph of \( f(x) = x^3 - 3x + 1 \). Be sure to show clearly the coordinates of all critical points and inflection points.
3. Find the absolute maximum and minimum values of $f(x) = 2x^3 + 3x^2 - 12x$ on the interval $[0, 2]$. 
4. A farmer wishes to fence off three identical adjoining rectangular pens as in the diagram shown. Determine the maximum total area that can be enclosed by these three pens if he only has 240 linear feet of fencing available? Your answer should include the $x$ and $y$ values which give this maximum area.