Graphing Calculator Practice for Quiz

Answer the following (Round to three decimal places if possible):

Given the function: $f(x) = x^3 + 3x^2 - x - 4$ **use a graphing utility to find:**

1. **Sketch the graph that is in your graphing utility window..**
2. **The coordinates where the relative maxima and minima exists (if possible).**
3. **The open interval(s) where the function is increasing, decreasing, or constant.**
4. **Approximate all the zeros to three decimal places.**
5. **Where is** $f(x) \geq 0$**?**
6. **Where is** $f(x) < 0$**?**

Answers:

1) **Graphing calculator**
2) **Coordinates of Maximum value:** $(-2.155, 2.079)$ **; Coordinates of the Minimum value:** $(.155, -4.079)$
3) **Increasing:** $(-\infty, -2.155)$ ***or*** $(.155, \infty)$; **Decreasing** $(-2.155, .155)$; **Constant: None**
4) **Zero(s):** $(-2.861, 0), (-1.254, 0), (1.115, 0)$
5) $f(x) \geq 0$ **when x is** $[-2.861, -1.254]$ **or** $[1.115, \infty)$
6) $f(x) < 0$ **when x is** $(-\infty, -2.861)$ **or** $(-1.254, 1.115)$