No books, notes or graphing calculators. Turn off your cell phones.

*(10)*   1.  Let $f(x) = x^4 - 2x^2 + 3$

(a)Find $x$ and $y$ intercepts of $f$

(b)Determine the intervals where $f$ is decreasing and increasing

(c)Calculate all local extrema of $f$ ( local maxima and minima )

(d)Does $f$ have a global maximum? global minimum? Give both $x$ and $y$ coordinates

(e)Using the above information make a sketch of the graph of $f$ marking the information on the graph