Name

Math 2100: calculus 1

Number 4

1. For the function $f\left(x\right)=-x^{3}+7x^{2}+x+1$ (a) locate all critical points and use the first derivative test to determine weather each is the location of a minimum, local maximum, or neither.
2. For the function $f\left(x\right)=x^{8}-2x^{4}-3$ (a) locate all the critical points and (b) use the second derivative test determine whether each is the location of a local minimum, local maximum or neither.
3. For the function $f\left(x\right)=2x^{3}+x^{2}-3x+1$ (a) determine the interval(s) over which $f^{'}\left(x\right)>0$ and (b) determine the interval(s) over which $f^{''}\left(x\right)>0$
4. Calculate $\lim\_{t\to \infty }\frac{3t^{2}-t+7}{8t^{2}+t+1}$
5. Calculate $\lim\_{t\to \infty }\sqrt{t^{2}+15t+9-t}$
6. Use information form the first and second derivatives to sketch the graph of $f\left(x\right)=x^{3}ⅇ^{-x}$ you must show me the information you use form these test to arrive at your graph and clearly label the graph.
7. A fence that is 8 feet tall and runs parallel to the fence of a building 4 feet away. What is the length of the shortest ladder that will reach from the ground, over the fence, to the side of the building?

I need this done ASAP 3 hours