1. Compute the Derivatives:

   a. $f(x) = x^2 - 5x + 6$
   b. $f(x) = \sin x$
   c. $f(x) = \cos x + x^2$

2. Write the Equation for the Line Tangent to the graphs of the above functions at the given points

   a. $a = 3$
   b. $a = \pi$
   c. $a = \pi/4$

3. For the above three functions given in 1(a),(b),(c), plot the function and its derivative next to one another.
4. For the given function in 1 (a),(b),(c), plot the find where the derivative equals to zero. Is this a maximum, minimum, or neither? Are there multiple maximum and minimum values on the domain?
5. Find all critical points for $f(x) = x^2 - 4x + 3$
6. For each of the following functions, find the absolute maximum and absolute minimum over the specified interval and state where those values occur.

   a. $f(x) = -x^2 + 3x - 2$ over $[1, 3]$
   b. $f(x) = x^2 - 3x^{2/3}$ over $[0, 2]$.

7. Suppose the island is 1 mi from shore, and the distance from the cabin to the point on the shore closest to the island is 15mi. Suppose a visitor swims at the rate of 2.5mph and runs at a rate of 6mph. Let x denote the distance the visitor will run before swimming, and find a function for the time it takes the visitor to get from the cabin to the island.

8.Owners of a car rental company have determined that if they charge customers p dollars per day to rent a car, where $50 \leq p \leq 200$, the number of cars they rent per day can be modeled by the linear function $n(p)=1000-5p$. If they charge Rs500 per day or less, they will rent all their cars. If they charge Rs.2000 per day or more, they will not rent any cars. Assuming the owners plan to charge customers between 500 per day and 2000 per day to rent a car, how much should they charge to maximize their revenue?