Assignment (Group 3)
Calculus and Analytical Geometry
Energy and Environment - Batch 15

1. Describe the limit of functions in your own words. Find the limit of the function $f(x) = 50$ given by

$$\lim_{x \to 1} f(x)$$

2. Define tangent line to any given curve $y = f(x)$. Show that the line given by equation $y = -4x + 17$ touches the curve $f(x) = 15 - 2x^2$ at point $x = 1$. Thus equation $y = -4x + 17$ is tangent line to curve $f(x) = 15 - 2x^2$ at point $x = 1$. Graph the line and curve separately and then combine both graphs. Validate the results graphically i.e. show that indeed line touches curve at point $x = 1$.

3. What is your understanding about Cartesian and Polar coordinates. How would you relate both?

4. Show the solution of the integral $\int \frac{18 \tan^2(x) \sec^2(x)}{2 + tan^3(x)} dx$ is $\frac{-6}{\tan^3(x)} + C$.

5. Find $\dfrac{dy}{dx}$ for the implicit function $3y^4 + x^7 = 5x$.

6. How would be explain the applications of integration and double integration?