1092 Calculus Quiz2 ET161B002 Date:2021/06/07 Total:100

Note: Don't use the calculator. To get full points, you should write down the procedure **in detail**.

1. Find the area under one arch of the cycloid $x = a(t - \sin t), y = a(1 - \cos t)$.

2. Find the area inside one leaf of three-leaved rose $r = \cos 3\theta$.

3. Find the value $\dfrac{\partial z}{\partial x}$ at the point (1,1,1) if the equation $xy + z^3x - 2yz = 0$ defines $z$ as a function of the two independent variables $x$ and $y$ and the partial derivative exist.

4. Let $f(x, y) = \dfrac{x - y}{x + y}$. Find the direction $\vec{u}$ and the values of $D_{\vec{u}f}(\dfrac{-1}{2}, \dfrac{3}{2})$for which is the largest.

5. Find the linearization of $f(x, y, z) = \dfrac{\sin xy}{z}$ at (2,0,1).