1. Find the distance between the point $(1,3,5)$ and the plane $x-y-z=1$.
2. Given the parametric equations $x=\cos ^{2}(t)$ and $y=\sin ^{2}(t)$, find an equation for the tangent line when $t=\frac{\pi}{4}$.
3. Find the length of the curve given by $x=\frac{y^{4}}{4}+\frac{1}{8 y^{2}}$ from $y=1$ to $y=2$.
4. Graph $r=4 \cos (\theta)$ in polar coordinates. Give the equation of the tangent line when $\theta=\frac{\pi}{6}$.
5. Find the area between the curves $r_{2}=1-\cos (\theta)$ and $r_{1}=2$.
6. Find the length of the spiral $r=\theta^{2}$ from $0 \leq \theta \leq \sqrt{12}$.
