MTH 265, Quiz #9, Summer 2021 Name _____

Instructions: Show all work. Use exact answers unless specifically asked to round. Be sure to complete all parts of each question.

1. Find the directional derivative of the function $f(x,y) = x\sin y - e^{xy}$ at the point $\left(1,\frac{\pi}{2}\right)$, in the direction of $\vec{u} = 5\hat{\imath} - 8\hat{\jmath}$.

2. Find the equation of the tangent plane for $f(x,y) = x^2y - xy^3$, at the point (1,-2).

3. Find the equation of the tangent plane for the parametric surface given by $\vec{r}(u,v) = u\cos v\,\hat{\imath} + u\sin v\,\hat{\jmath} + uv^3\hat{k}$ at the point $(-3,0,-3\pi^3)$.