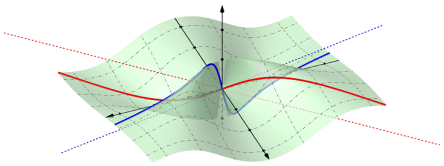
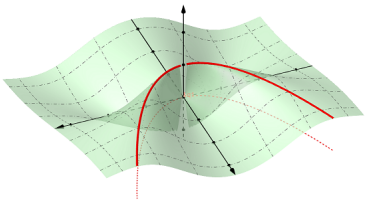
Problem. Consider $\lim\limits_{(x,y)\to(0,0)} \dfrac{x^2y}{x^4+y^2}$.

(a) Determine the path limit at $(0,0)$ along all straight paths. (Hint: Different straight paths have different algebraic expressions. Therefore, you have to deal with **three** categories (NOT three concrete examples.))



(b) Determine the path limit at $(0,0)$ along the parabolic path $y = x^2$.



(c) Dose the (overall) limit exist? Type your explanation. (**Remark.** Handwritten response receives no credit for this part.)