Question
Let $f_a(x) = x^4 - 3ax^2 + x + 2a^2$. Show that fixed points for f_a are created as a increases through zero, but this is n̲ot a saddle-node bifurcation. Which conditions in Theorem A fail?

Answer
$f_a(x) = x$ where $x^4 - 3ax^2 + 2a^2 = 0$ i.e. $(x^2 - a)(x^2 - 2a) = 0$. No solutions for $a > 0$; solutions $\pm a, \pm\sqrt{2}a$ for $a > 0$. We have $f_0'(0) = 1$ (OK for saddle-node) but $\left.\dfrac{\partial}{\partial a} f_a(0)\right|_{a=0} = 4a|_{a=0} = 0$: second condition fails.