Problem 51, Chemistry 301X - 2006

In your answer to Problem 50e, we'll bet you said something like, "The three-membered ring is strained (therefore high energy) and opens more easily than the five-membered ring."

Sort of.

But it is really more complex than that. For example, both the starting material - the epoxide shown in 50e - and the transition state are strained, right? Yes. So, exactly why does the three-membered ring open more easily than the five-membered ring? To answer this correctly, you have to place both starting materials and both transition states on an energy diagram. Please do.

Of course, the products are irrelevant. Why?