The Division of Labor is Valuable Even in a Perfectly Equal World

I once took an econ test at a summer seminar that included the following question:

"If two people were perfectly equal in every way, would they benefit from the division of labor and exchange?"

I answered 'yes'. The professor told me I was wrong. I maintain to this day I wasn't.

I understand what he's driving at. Differences in ability and taste are to be celebrated in a market because they mean differences in opportunity cost, which means opportunity for specialization and trade which expands wealth for all. As the Ricardo principle demonstrates, even someone who's worse at everything, by having a lower opportunity cost in some things, can create win-wins such that trade improves the condition of all.

I also know that there is no possible world without inequality. Inequality in ability and preferences between humans is a fact and one that creates huge gains for everyone in the market.

Still, the hypothetical of two perfectly equal people on a desert island doesn't do away with gains from trade!

If I can imagine a single scenario in which two people with zero difference in skill or preference can both benefit from the division of labor and exchange, my answer was correct and the professor was wrong. (This was like 10 years ago. Still, can't let it go.)

It's easy to imagine such a scenario. Fran and Stan are identical in every way and trapped on an island. They both prefer an equal mix of fish and berries for sustenance, and both have an equal ability to acquire both. Say both foods spoil after a single day, so you have to eat them the day you acquire them. If they each spend half a day fishing and half collecting berries, they'll each get 10 berries and 2 fish.

But let's say there's a better fishing spot farther away from camp and a better spot for berries deeper in the woods. To reach them, work, and return, it would take a full day committed to one activity. Fran goes fishing all day at the more remote and plentiful fishing spot and catches 6 fish. Stan treks deeper into the woods for a day of berries and collects 24. They trade and end up with 12 berries and 3 fish each.

This scenario doesn't require either to be more skilled than the other, or either to have a different opportunity cost than the other. Even two perfectly equal individuals benefit from trade due to the scarcity of time and place.

Now how do I get that professor to change that 'N' to a 'Y'?