QUIZ 32 NAME:_____

Proline Synthesis

1. Draw glutamate.

2. Glutamyl-kinase phosphorylates the side chain carboxylic acid.

3. Glutamyl-phosphate dehydrogenase reduces the phosphorylated carboxylic acid of the side chain to an aldehyde. The phosphate group leaves as inorganic phosphate.

4. The backbone amine acts as a nucleophile, the aldehyde carbonyl carbon acts as an electrophile, and the aldehyde carbonyl oxygen leaves as water. This forms the cyclic ring found in proline, with a C=N (imine).

5. The imine is reduced to yield a methylene carbon and a secondary amine. Proline!