When do two gluing diagrams yield the same surface?

There are two basic "moves" which change a gluing diagram into a similar diagram yielding the same surface. Any two diagrams that yield the same surface, can be changed into one another by a sequence of such moves.

1. **Tear a new pair of edges** (or "untear" an existing pair of edges)

2. **Tear off a triangle, and reattach it elsewhere**

To figure this out with one intermediate drawing, draw the tear, add the triangle to a matching edge, copy the label to the cut, imagine moving the triangle and copy the labels. Redraw, (We circled the old \( \Rightarrow \) as \( \oplus \) to tell it apart.)
One can also reverse a pair of edges, or change their symbol.

Show that the following two surfaces are the same:

Example:

P ≠ P

Solution:

Move a triangle

Rotate

Exercises:

(a)  
(b)  
(c)  
(d)  
(e)  
(f)  

If you can do all these, make up several problems not on this list, that you're expecting might be on the test.