MATH 348 Reading Questions

Section 5.4 NAME _____

Read Section 5.4 in the text and answer the following questions. This sheet will be checked for completeness at the beginning of the next class.

1. In what way is the 2-sphere S^2 a "quotient" of the closed disk (or disc) D^2?

2. How is a topology defined on a quotient space? In other words, how do you know which sets are open in the quotient space?

3. Describe the quotient space $\mathbb{R}/\mathbb{Z}$.

4. On page 80, the text mentions an *equivalence relation*. What is an equivalence relation? What three properties does it satisfy? (You may need to look this up in another source.)

5. In Example 5.58, the space $\mathbb{R}P^{n-1}$ is constructed via an equivalence relation on the points of $\mathbb{R}^n - \{0\}$. How does this in fact give the same construction as earlier in Examples 3.33 and 3.34?

6. If X is a compact space and $Q = X/\sim$ is a quotient space, is Q compact? Why or why not?