Practice Exercises on Logical Connectives

1. State the contrapositive and converse. Also write the statement in an equivalent form using only $\sim$ and $\vee$.

> If f is continuous on the interval $[a, b]$ and differentiable on the interval (a, b), then there is a point c in (a, b) where $f'(c) = \frac{f(b) - f(a)}{b - a}$.

2. a) John is on the phone with his mother discussing Christmas plans. He has a sister Sally. He says:

> "I won't come home for Christmas unless Sally does."

Let J be the proposition "John will come home for Christmas"
       S be the proposition "Sally will come home for Christmas"

Write what John meant in terms of J, S and using " $\Rightarrow$ "

   b) Using logical connectives, write

> "John will come home for Christmas but Sally won't."

3. Write the contrapositive:

> "If the ocean was whiskey and I was a duck, I'd swim to the bottom and never come up."   (*A line from a cowboy song sung by old-time cowboy movie star Tex Ritter.*)