Name: _____

This retest is due at the beginning of class, Monday, October 10, 2016.

1. (15 points) Consider the input/output table below.

Input			Output
P	Q	R	S
1	1	1	1
1	1	0	0
1	0	1	0
1	0	0	1
0	1	1	0
0	1	0	1
0	0	1	0
0	0	0	0

   (a) State the disjunctive normal form of the Boolean expression for the input/output table.

   (b) Simplify the Boolean expression as much as possible and draw the corresponding circuit.

7. (15 points) Let $T(x, y)$ be the predicate "x trusts y".

(a) Interpret in English: $\forall y$, $\exists x$ such that $\sim T(x.y)$.

(b) Give the symbolic and English negations of the statement in (a).

(c) Convert the English statement "Somebody trusts everyone" into symbolic form.

(d) Give the symbolic and English negations of the statement in (c).

8. (15 points) For each of the following arguments, draw a Venn Diagram, and use it to decide if the argument is valid or invalid.

(a) If an infinite series converges, then its terms go to 0.

The terms in the infinite series $\sum \frac{1}{n}$ go to 0.

Therefore, the infinite series $\sum \frac{1}{n}$ converges.

(b) All polynomial functions are differentiable on $\mathbb{R}$.
All differentiable functions on $\mathbb{R}$ are continuous on $\mathbb{R}$.
No continuous functions on $\mathbb{R}$ have vertical asymptotes.
p is a polynomial function.
Therefore, p does not have vertical asymptotes.