CSCI 1900 - Homework 9-B

**Section 1.1, 1.2, 1.4:**  *(22)*

Let

*p*: I go jogging.

*q*: It is raining

*r*: Burf does not go jogging

*s*: I am awake

1. Write the following in terms of p, q, r and logical connectives (4)
	1. Burf and I go jogging
	2. I am not awake or I go jogging
	3. It is not raining, and I do not go jogging
	4. Burf goes jogging if I am awake
2. Write the following in terms of p, q, r and logical connectives (4)
	1. I go jogging if and only if it is not raining
	2. Being awake is necessary for me to go jogging
	3. If I am awake and it is raining, Burf goes jogging
	4. If it is raining is sufficient for me to not go jogging
3. Let

*p*: 4 <1

*q*: 2>1

*r*: $7\geq 7$

*s*: 4 < 4

Write the following in terms of p, q, r and logical connectives (3)

* 1. 4<1 or 2>1
	2. If $7\geq 7$ then 4<4
	3. It is not the case that 4<4 or 4<1
1. Use a truth table to determine if each of the following is a tautology, a contingency, or an absurdity. (4)
	1. $q∧\~q$
	2. $\~p⇒(p⇒q)$
	3. $p ∨\~p$
	4. $\~p∧q$
2. Let

*p* and *q* are true

*r* and *s* are false

Find the truth value for each of the following (4)

* 1. $\left(r⇒p\right)∧\left(q⇒s\right)$
	2. $\left(p⇒q\right)⇔\left(\~p∨q\right)$
	3. ~$\left(p⇒q\right)∨\left(p∧\~q\right)$
	4. $\left(\left(p⇒q\right)∧\left(q⇒r\right)\right)⇔\left(p⇒r\right)$
1. Write the negation of the following in good English (3)
	1. The weather is snowy and I will skip class
	2. I will not skip class or I will not pass the course.
	3. If Burf is not hungry then if he eats, he will be uncomfortable