CISP 440

Austin Smothers

Homework 10

## Section 1.1

1. This is a proposition. Its negation is:

There are no positive integers n, for which 19340 = n \* 17

1. This is not a proposition, it is a command
2. Negation: No heads were obtained
3. neg(F v T) ^ (neg(F) v F) 🡪 negT ^ (T v F) 🡪 F ^ T 🡪 **F**
4. (p v q) ^ neg(p)

|  |  |  |
| --- | --- | --- |
| P | Q | T/F |
| T | T | F |
| T | F | F |
| F | T | T |
| F | F | F |

1. True
2. It is hot, and it is not the case that either today is Monday or it is raining
3. (p v q)
4. r v (p ^ q)
5. P exor Q is true if either is true, but not both

|  |  |  |
| --- | --- | --- |
| P | Q | T/F |
| T | T | F |
| T | F | T |
| F | T | T |
| F | F | F |

1. P: Lung Disease

Q: Lung Cancer

P ^ neg(Q)

## Section 1.2

1. P: Better cars will be built

Q: Buick will build better cars

1. If Joey studies hard, he will pass the discrete mathematics exam;

If Rosa ahs 160 quarter-hours of credits, then she may graduate;

If Fernando obtains $2000, then he may buy a computer;

If Katrina passes discrete mathematics, then she may take the algorithms course;

If Buick builds better cars, then better cars will be built;

If the chairperson gives the lecture, then the audience will go to sleep;

If the program is well structured, then it will be readable

1. Joey will not be able to pass the discrete mathematics exam if he does not study hard;

Rosa will not graduate if she does not have 160 quarter-hours of credits;

Fernando will not be able to buy a computer if he does not obtain $2000;

Katrina will not be able to take the algorithms course if she does not pass discrete mathematics;

If better cars are not built, Buick will not build them;

The audience will not go to sleep if the chairperson does not give the lecture;

The program is not readable if it is not well structured;

*P: F R: F Q: T R: T*

1. (p 🡪 q) 🡪 r = (f 🡪 t) 🡪 t = t 🡪 t = **t**

*P: T Q: F R: ?*

1. ?
2. F
3. T
4. (P ^ R) 🡪 Q
5. If today is not Monday, then either it is raining outside, or it is hot.
6. (-3 < 1 ^ 1 < 3) 🡪 |1| < 3 T

|1| < 3 🡪 (-3 < 1 ^ 1 < 3) T

|1| > 3 🡪 (-3 > 1 ^ 1 > 3) T

1. P 🡪 Q = neg(P) v Q (must either be both true or both false for all truths

|  |  |  |  |
| --- | --- | --- | --- |
| P | Q | P 🡪 Q | Neg(P) v Q |
| T | T | T | T |
| T | F | F | F |
| F | T | T | T |
| F | F | F | T |

**P != Q according to DeMorgan’s laws**