CS 278 Homework 2

1.3.1 b) If January has 31 days, then 7 is an even number.

T →F. False

1.3.1 d) If 7 is an even number, then January has exactly 28 days.

F→F. True

1.3.2 b) If he trained for the race, then he finished the race.

Converse: If he finished the race, then he trained for the race.

Contrapositive: If he didn’t finish the race, then he didn’t train for the race.

Inverse: If he didn’t train for the race, then he didn’t finish the race.

1.3.2 d) If it was sunny, then the game was held.

Converse: If the game was held, then it was sunny.

Contrapositive: If the game was not held, then it was not sunny.

Inverse: If it was not sunny, then the game was not held.

1.3.2 e) If it snowed last night, then school will be cancelled.

Converse: If school was cancelled, then it snowed last night.

Contrapositive: If school was not cancelled, then it did not snow last night.

Inverse: If it didn’t snow last night, then school won’t be cancelled.

1.3.3 c) If 5 is a negative number, then 3 is a positive number.

Converse: If 3 is a positive number, then 5 is a negative number.

False

Contrapositive: If 3 is not a positive number, then 5 is not a negative number.

True

Inverse: If 5 is not a negative number, then 3 is not a positive number.

False.

1.3.4

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| P | q | a)  (¬p ∧ q) → p | d)  (p ↔ q) ⊕ (p ↔ ¬q) | e)  (p ∨ q) ↔ (q ∧ p) |
| T | t | T | T | t |
| T | F | T | T | F |
| F | T | F | T | F |
| f | F | T | T | T |

1.3.5 b) If I return to college, then I won’t get a job.

C → ¬ J

d) I will return to college only if I won’t get a job.

C → ¬ J

f) I will get a job and return to college.

J ∧ C

1.3.6 a) If a B average is maintained, then Joe will be eligible for the honors program.

d) If Rajiv is at least four feet tall, then he can go on the roller coaster.

1.3.7 b) A person can park in the school parking lot if they are a senior or at least seventeen years of age.

P → (S v Y)

d) A person can park in the school parking lot if and only if the person is a senior and at least 17 years old.

P → (S ∧ Y)

1.3.8 b) The roads were wet and there was an accident.

c) There was not an accident, and the traffic was not heavy.

e) The roads were wet or the traffic was not heavy.

1.3.9 a) The applicant is not eighteen years old but does have parental permission.

¬ Y ∧ P

c) the applicant can enroll in the course only if the applicant has parental permission.

C → P

1.3.10 p=T q=F r=?

b) (p ∨ r) → r, (T ∨ ?) → ?, T → ?, ?

d) (p ∧ r) ↔ (q ∧ r), (T ∧ ?) ↔ (F ∧ ?), ? ↔ F, ?

f) (p ∧ q) → r, (T ∧ F) → ?, F → ?, T