Intro to Math Thinking Fall 2024: Assignment 2

1. (a) $0 < \pi < 10$
   (b) $7 \leq p < 12$
   (c) $5 < x < 7$
   (d) $x < 4$
   (e) $(y < 4) \wedge (-3 < y < 3) = -3 < y < 3$
   (f) $x = 0$
2. (a) π is between 0 and 10
   (b) p is greater than or equal to 7 and less than 12
   (c) x is between 5 and 7
   (d) x is less than 4
   (e) y is between -3 and 3
   (f) x equals 0
3. Show that $\phi_1, \phi_2, ..., \phi_n$ are all true
4. Show that at least 1 of $\phi_1, \phi_2, ..., \phi_3$ is false
5. (a) $\pi > 3$
   (b) $x \neq 0$
   (c) $x \geq 0$
   (d) $x \geq 0$
   (e) $(x > 3) \vee (x < -3)$
6. (a) π is greater than 3
   (b) x is not equal to 0
   (c) x is greater than or equal to 0
   (d) x is greater than or equal to 0
   (e) x is less than -3 or greater than 3
7. Find at least 1 of $\phi_1, \phi_2, ..., \phi_n$ is true
8. Show that all $\phi_1, \phi_2, ..., \phi_n$ are false
9. (a) $\pi \leq 3.2$
   (b) $x \geq 0$
   (c) $\neg(x < 0 \vee x > 0) = \neg(x \neq 0) = x = 0$
   (d) $x \neq 1$

(e) ψ

10. (a) π is less than or equal to 3.2
    (b) x is greater than or equal to 0
    (c) x equals 0
    (d) x is not equal to 1
    (e) ψ

11. (a) $D \wedge Y$
    (b) $\neg Y \wedge T \wedge D$
    (c) $\neg(D \wedge Y)$
    (d) $T \wedge \neg D \wedge \neg Y$
    (e) $\neg T \wedge D \wedge Y$

    Use true/false table to ensure sentence and logical statements are same

1 Discussion

1. ,,not guilty": interpreted as not proven
   ,,¬ guilty": innocent
   ,,not guilty" and ,,¬ guilty" are not the same
   ,,not proven" is equivalent to ,,¬ proven" which is the literal interpretation

2. don't use double negatives
   use ¬ DISPLEASED for the interpretation of ,,I was not displeased with the movie"