

PHIL 422: Examples, Practice Problems, Assignment #1

The homework assignment (7-20 below) is due Sunday, August 30th by 10pm. Submit your answers as a PDF file you directly upload to the Submission area in Canvas (i.e., do NOT send me a link to a Google Drive with your homework file in it).

For each of the following, determine whether it is a wff. If not, explain why not. If it is, explain why.

Worked Examples: [Answers in RED]

1. $(\forall x(P(x) \rightarrow Q(x)) \wedge \exists y(P(y) \leftrightarrow R(y)))$

1. Rule 0: "P(x)," "Q(x)," "P(y)," "R(y)" are wffs

2. Rule 5, Line 1: " $(P(y) \leftrightarrow R(y))$ " is a wff

3. Rule 4, Line 1: " $(P(x) \rightarrow Q(x))$ " is a wff

4. Rule 7, Line 2: " $\exists y(P(y) \leftrightarrow R(y))$ " is a wff

5. Rule 6, Line 3: " $\forall x(P(x) \rightarrow Q(x))$ " is a wff

6. Rule 2, Lines 4+5: " $(\forall x(P(x) \rightarrow Q(x)) \wedge \exists y(P(y) \leftrightarrow R(y)))$ " is a wff

Answer: WFF!

2. $\forall c (A(c) \rightarrow B(c))$

1. Rule 0: "A(c)," "B(c)" are wffs

2. Rule 4, Line 1: " $(A(c) \rightarrow B(c))$ " is a wff

3. Rule 6, Line 2: " $\forall c(A(c) \rightarrow B(c))$ " is NOT a wff because "c" is not a variable!

Answer: Not a wff!

Practice Problems (I can go through any of these in Office Hours.)

3. $\forall x(A(x) \wedge (B(x) \rightarrow C(x) \wedge D(y)))$

4. $(\forall x)(F(x) \rightarrow G(x))$

5. $\exists y(E(x) \wedge F(x))$

6. $\exists x(Ax \wedge \forall x(Fx \rightarrow Gx))$

Assignment (These are what you need to turn in to the Canvas submission area on Sunday 8/30 by 10pm)

7. $\forall x(F(x) \rightarrow \forall yH(x,y))$

8. $\neg \forall x((F(x) \wedge G(x)) \rightarrow H(x))$

9. $(\forall x(F(x) \rightarrow G(x)) \vee \forall x(G(x) \vee H(x)))$

10. $\neg \neg \exists x (A(x) \wedge B(x))$

11. $(P(a) \rightarrow \forall x(P(x) \rightarrow Q(x))) \rightarrow Q(a)$

12. $((A(a) \wedge B(b)) \rightarrow \forall xyz(P(x,y) \rightarrow Q(y,z)))$

13. $E(xcellent)$

14. $\forall xPx \ \& \ Qx$

15. $\exists x \exists y \exists z (P(x,y) \wedge P(y,z)) \rightarrow P(a,b)$

16. $((P(x) \wedge (P(y) \vee P(z)))$

17. How many course topic modules are there for this class?

18. Which is a bigger portion of your final grade, the First Test or your Homework?

19. Under the Learning Goals for the course, what is goal 2.C.?

20. What happens if you miss one of the tests? How would that factor into your grade?