**Sentential Derivation Problems**

**BASIC DERIVATION PROBLEMS – NO SUBDERIVATIONS**

These questions just use MP, MT, DN and R. They require no subderivations.

They are meant to help those who want more exercises to get used to the basic rules and derivation types.

You can do these questions on paper or, if you want, you can use Logic 2010 (and it will check your work).

To use Logic 2010, open the derivations module, then click user (the button in the menu at the bottom).

Now copy and paste (or type) the question in.

These are all Basic DD (no sub-derivations):

W → R. W. R → X. ∴ X

R → ~Q. P → Q. R. ∴ ~P

~Y. S → Z. Z → Y. ∴ ~S

(W → T) → S. (W → T). S → Z. ∴ Z

~(P → Q). ~S → R. R → (P → Q). ∴ S

P → (~(S → ~P) → W). P. W → ~P. ∴~S

These are all Basic CD: Don’t forget that you can use your assumption for CD as well as the premises!

Q → S. T → ~S. ∴ T → ~Q

P → (Q → S). Q. ∴ P → S

S → T. W → S. X → W. ∴ ~T → ~X

~(R→S)→T. P→~T. ∴P → (R→S)

P. P → T. S → (T → ~Q). ∴ (~S → ~P) → ~Q

(Q→R) → (P→(~T→R)). ~(Q→R)→T. P. R→S. ∴ ~T→S

These are DD and CD mixed: Don’t forget to analyze your show line. If it is a → sentence, assume antecedent for CD!

T → ~S. ~R → T. T → (Q → S). ~R. ∴ ~Q

~(P→Q)→Z. P. Q→T. ∴~Z→T

Q → ~R. P. ~S →R. ∴ (P → Q) → S

X. Q → W. P →Q. ∴ (W → ~X) → ~P

P → (W → Z). ~S → P. ~Z. ~S. ∴ ~W

~R→(S→T). ~~W. W→ ~(S→T). ∴~~R

~~W. X → P. R →X. ∴ (P → ~W) → ~R

The following are all basic ID’s. Indirect Derivation, no sub-derivations.

~X → P. Q → X. P →Q. ∴ X

S→T. T →R. ~R. ~S →R. ∴ Z

Q → S. T→~Q. R → T. S → R.. ∴ ~Q

~W. T. ~W→(S→R). R→W. ~W →(T →S). ∴~(P→Q)

S→~Q. T. T→ X. ~S→ ~X. ∴ ~(Q → P)

~T → (P→Q). P→~S. P. T→Z. Z→Q. ∴ ~(Q→S)

Now Mixed DD, CD and ID

~(P → Q) → R. P. ∴ ~R → Q

Q. S → (T → R). ~R. Q→S. ~T → ~P. ∴ ~P

R → ~S. ~S →~T. S →R. T. ∴ W

R → ~S. P. P → R. ∴ (T → S) → ~T

P. P→~S. Q. ∴ ~(P→(Q→S))

Q → (~W → (Z → ~Q)). Q. Q → ~W. ∴~Z

~(R → S) → ~T. P → T. ~R →~W. W → P. ∴ W → S

Z → S. Z→ ~Q. ~P → Z. ~P. ~(R → Q) → P ∴ ~(S →R)

~X → (W → ~Y). ~W → S. ~X. S→X. ∴ (T → Y) → ~T

Q→S. ~S. T. ~P→W. W → (T →Q). ∴ ~(P→Q)