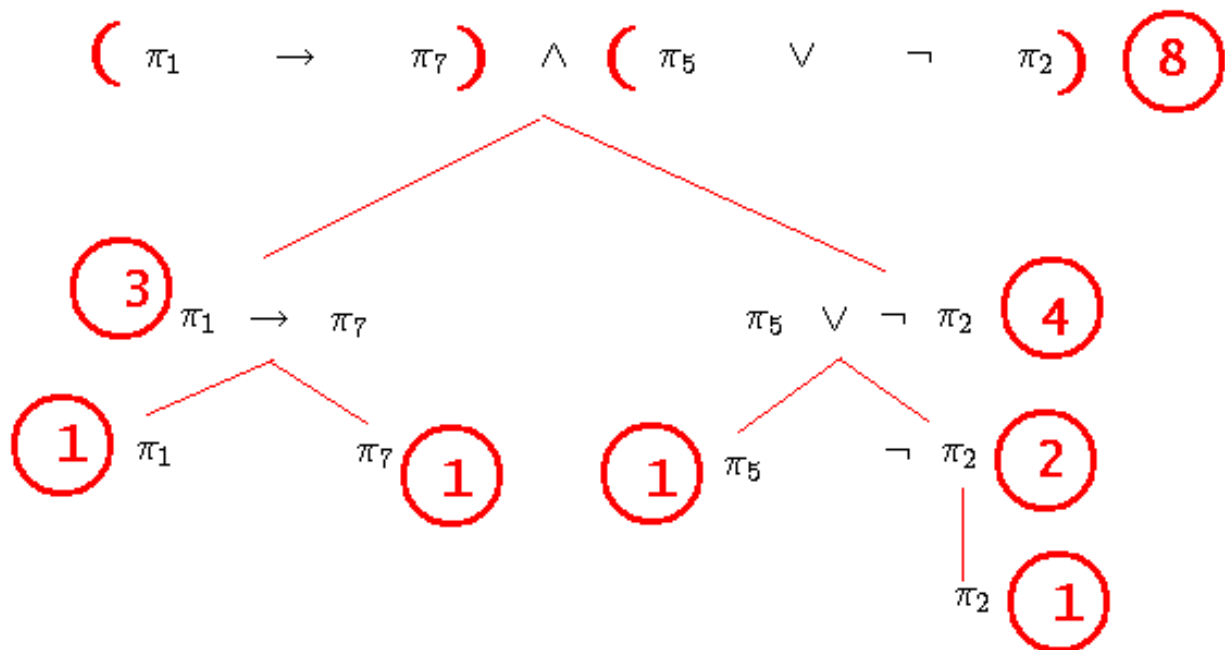


Name (please print): **Answers**

Math 250 Quiz 2, Monday 6 October 2008, 1 page, 20 points, 20 minutes

(11 points) Rewrite the formula $((\pi_1) \rightarrow (\pi_7)) \wedge ((\pi_5) \vee (\neg(\pi_2)))$ with as few parentheses as possible for a correct formula.

Then, below the formula, draw a tree diagram for it. Then label each subformula with its rank.



(9 points) The string $\pi_3 \vee \neg \pi_1 \rightarrow \pi_2$ is not a formula; it has too few parentheses. By inserting additional parentheses into $\pi_3 \vee \neg \pi_1 \rightarrow \pi_2$ in different ways, obtain three correct formulas that are different in the sense that they would have different tree diagrams. (You are not required to draw the tree diagrams.)

$$\pi_3 \vee \neg (\pi_1 \rightarrow \pi_2)$$
$$\pi_3 \vee ((\neg \pi_1) \rightarrow \pi_2)$$
$$(\pi_3 \vee \neg \pi_1) \rightarrow \pi_2$$