Rules of Inference

Name of rule	Premises	Conclusion
Simplification (Simp)	$P \wedge Q$	P
Addition (Add)	P	$P \vee Q$
Conjunction (Conj)	P, Q	$P \wedge Q$
Disjunctive syllogism (DS)	$P \vee Q, \neg P$	Q
Modus ponens (MP)	$P, P \rightarrow Q$	Q
Modus tollens (MT)	$P \rightarrow Q, \bar{Q}$	$\bar{P}$
Hypothetical syllogism (HS)	$P \rightarrow Q, Q \rightarrow R$	$P \rightarrow R$
Absorption (Abs)	$P \rightarrow Q$	$P \rightarrow (P \wedge Q)$
Constructive dilemma (CD)	$P \rightarrow Q, R \rightarrow S, P \vee R$	$Q \vee S$

Practice the following Questions:

Establish the validity of the following arguments:

1. 'All students are serious. Some students do not engage in class activities. Therefore, some students who do not engage in class activities are serious.'
2. 'Everyone shouts or cries. Not everyone cries. So some people shout and don't cry.
3. Some monkeys eat bananas. All monkeys are primates. Therefore some primates eat bananas.
4. All cars are dangerous weapons. No dangerous weapons should be given to children. Therefore cars should not be given to children.