Name _____Quiz 1

1) Assume P and Q are true, while R is false. Find the truth value of the statement forms below.

a) $P \vee R$

b) $R \Rightarrow Q$

c) $\sim Q$

2) Let P be "It will rain today" and Q be "I will use an umbrella". Write down the statement form that represents the statement "If it rains today, then I will use an umbrella".

3) Fill in the missing pieces of the proof below.

Claim: $\big((P \Rightarrow E) \wedge (P \vee C) \wedge (I \Rightarrow \sim C) \wedge I\big) \Rightarrow E$

Statements	Reasoning	
$I \Rightarrow \sim C$	_____	(1)
I	_____	(2)
_____	Modus Ponens applied to lines 1 and 2.	(3)
$P \vee C$	_____	(4)
P	Disjunctive Syllogism applied to lines 3 and 4.	(5)
$P \Rightarrow E$	_____	(6)
E	_____	(7)

Dictionary of previous theorems used:
Modus Ponens: $\big(P \wedge (P \Rightarrow Q)\big) \Rightarrow Q$
Disjunctive Syllogism: $\big((P \vee Q) \wedge \sim Q\big) \Rightarrow P$

4) Construct a proof of the claim below.

Claim: $\big(P \wedge (S \vee R) \wedge (P \Rightarrow \sim R)\big) \Rightarrow S$

Statements	Reasoning	
_____	_____	(1)
_____	_____	(2)
_____	_____	(3)
_____	_____	(4)
_____	_____	(5)
_____	_____	(6)
_____	_____	(7)
_____	_____	(8)
_____	_____	(9)
_____	_____	(10)

Hint: You may not need every line, but you will need the theorems below:

Modus Ponens: $\big(P \wedge (P \Rightarrow Q)\big) \Rightarrow Q$
Disjunctive Syllogism: $\big((P \vee Q) \wedge \sim Q\big) \Rightarrow P$