

9-4, 1-6

1. $P \vee \sim Q$

$\sim Q$

$\sim P$

P	Q	$\sim Q$	$(P \vee \sim Q)$	$\sim P$
T	T	F	T	F
T	F	T	T	F
F	T	F	F	T
F	F	T	T	T

row in which all premises are true and conclusion is false

↳ invalid

2. $P \rightarrow Q$

$\sim Q$

$\sim P$

P	Q	$(P \rightarrow Q)$	$\sim Q$	$\sim P$
T	T	T	F	F
T	F	F	T	F
F	T	T	F	T
F	F	T	T	T

no row in which all premises are true and conclusion is false

↳ valid

3. going to need 8 rows for this one!

see next page

3. $\sim(P \vee Q)$
 $R \rightarrow P$
 $\sim R$

P	Q	R	$(P \vee Q)$	$\sim(P \vee Q)$	$R \rightarrow P$	$\sim R$
T	T	T	T	F	T	F
T	T	F	T	F	T	T
T	F	T	T	F	T	F
T	F	F	F	T	T	T
F	T	T	T	F	F	F
F	T	F	T	F	T	T
F	F	T	T	F	F	F
F	F	F	F	T	T	T

no row in which all premises are true
 and conclusion is false $\rightarrow$ valid

4. $P \rightarrow (Q \rightarrow R)$
 $\sim(P \rightarrow Q)$
 R

P	Q	R	$Q \rightarrow R$	$P \rightarrow (Q \rightarrow R)$	$P \rightarrow Q$	$\sim(P \rightarrow Q)$
T	T	T	T	T	T	F
T	T	F	F	F	T	F
T	F	T	T	T	F	T
T	F	F	T	T	F	T
F	T	T	T	T	T	F
F	T	F	F	T	T	F
F	F	T	T	T	T	F
F	F	F	T	T	T	F

row in which all premises are true and
 conclusion is false $\rightarrow$ invalid

5. $P \vee (Q \rightarrow R)$
 $Q \& \sim R$
 $\sim P$

P	Q	R	$Q \rightarrow R$	$P \vee (Q \rightarrow R)$	$\sim R$	$(Q \& \sim R)$	$\sim P$
T	T	T	T	T	F	F	F
T	T	F	F	<u>T</u>	T	<u>T</u>	<u>F</u>
T	F	T	T	T	F	F	F
T	F	F	T	T	T	F	F
F	T	T	T	T	F	F	F
F	T	F	F	F	T	T	T
F	F	T	T	T	F	F	F
F	F	F	T	T	T	F	F

row in which all premises are true
 and conclusion is false $\rightarrow$ invalid

6. $(P \rightarrow Q) \vee (R \rightarrow Q)$
 $P \& (\sim P \rightarrow \sim R)$
 Q

P	Q	R	$P \rightarrow Q$	$R \rightarrow Q$	$((P \rightarrow Q) \vee (R \rightarrow Q))$	$\sim P$	$\sim R$	$(\sim P \rightarrow \sim R)$	$P \& (\sim P \rightarrow \sim R)$
T	T	T	T	T	T	F	F	T	T
T	T	F	T	T	T	F	T	T	T
T	F	T	F	F	F	F	F	T	F
T	<u>F</u>	F	F	T	<u>T</u>	F	T	T	<u>T</u>
F	T	T	T	T	T	T	F	F	F
F	T	F	T	T	T	T	T	T	F
F	F	T	T	F	T	T	F	F	F
F	F	F	T	T	T	T	T	T	F

row in which all premises are true
 and conclusion is false $\rightarrow$ invalid