

Truth Tables Worksheet 2

Question 1

Complete the truth table below to determine whether $A \Rightarrow \neg B$ is equivalent to the statement “ A and B cannot both be true.”

A	$\neg A$	B	$\neg B$	$A \Rightarrow \neg B$	A and B cannot both be true
T	F	T	F		
T	F	F	T		
F	T	T	F		
F	T	F	T		

Conclusion: Equivalent / Not equivalent

Question 2

Complete the truth table below to determine whether $\neg C \Rightarrow D$ is equivalent to the statement “ $\neg C$ and $\neg D$ cannot both be true.”

C	$\neg C$	D	$\neg D$	$\neg C \Rightarrow D$	$\neg C$ and $\neg D$ cannot both be true
T	F	T	F		
T	F	F	T		
F	T	T	F		
F	T	F	T		

Conclusion: Equivalent / Not equivalent

Question 3

Complete the truth table below to determine whether $E \Rightarrow F$ is equivalent to the statement “ E and F cannot both be true.”

E	$\neg E$	F	$\neg F$	$E \Rightarrow F$	E and F cannot both be true
T	F	T	F		
T	F	F	T		
F	T	T	F		
F	T	F	T		

Conclusion: Equivalent / Not equivalent

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Question 4

Complete the truth table below to determine whether $\neg G \Rightarrow \neg H$ is equivalent to the statement “ $\neg G$ and H cannot both be true.”

G	$\neg G$	H	$\neg H$	$\neg G \Rightarrow \neg H$	$\neg G$ and H cannot both be true
T	F	T	F		
T	F	F	T		
F	T	T	F		
F	T	F	T		

Conclusion: Equivalent / Not equivalent

Question 5

Complete the truth table below to determine whether $I \Rightarrow \neg J$ is equivalent to the statement “ $\neg I$ and J cannot both be true.”

I	$\neg I$	J	$\neg J$	$I \Rightarrow \neg J$	$\neg I$ and J cannot both be true
T	F	T	F		
T	F	F	T		
F	T	T	F		
F	T	F	T		

Conclusion: Equivalent / Not equivalent

Question 6

Complete the truth table below to determine whether $K \Rightarrow L$ is equivalent to $\neg L \Rightarrow \neg K$.

K	$\neg K$	L	$\neg L$	$K \Rightarrow L$	$\neg L \Rightarrow \neg K$
T	F	T	F		
T	F	F	T		
F	T	T	F		
F	T	F	T		

Conclusion: Equivalent / Not equivalent

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Question 7

Complete the truth table below to determine whether $\neg M \Rightarrow N$ is equivalent to $N \Rightarrow \neg M$.

M	$\neg M$	N	$\neg N$	$\neg M \Rightarrow N$	$N \Rightarrow \neg M$
T	F	T	F		
T	F	F	T		
F	T	T	F		
F	T	F	T		

Conclusion: Equivalent / Not equivalent

Question 8

Complete the truth table below to determine whether $O \Rightarrow \neg P$ is equivalent to $P \Rightarrow \neg O$.

O	$\neg O$	P	$\neg P$	$O \Rightarrow \neg P$	$P \Rightarrow \neg O$
T	F	T	F		
T	F	F	T		
F	T	T	F		
F	T	F	T		

Conclusion: Equivalent / Not equivalent

Question 9

Complete the truth table below to determine whether $\neg Q \Rightarrow \neg R$ is equivalent to $\neg R \Rightarrow \neg Q$.

Q	$\neg Q$	R	$\neg R$	$\neg Q \Rightarrow \neg R$	$\neg R \Rightarrow \neg Q$
T	F	T	F		
T	F	F	T		
F	T	T	F		
F	T	F	T		

Conclusion: Equivalent / Not equivalent

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Question 10

Complete the truth table below to determine whether $\neg S \Rightarrow T$ is equivalent to $\neg T \Rightarrow S$.

S	$\neg S$	T	$\neg T$	$\neg S \Rightarrow T$	$\neg T \Rightarrow S$
T	F	T	F		
T	F	F	T		
F	T	T	F		
F	T	F	T		

Conclusion: Equivalent / Not equivalent

Question 11

Complete the truth table below to determine whether $A \wedge B$ and $\neg A \vee \neg B$ are negations of each other.

A	$\neg A$	B	$\neg B$	$A \wedge B$	$\neg A \vee \neg B$	$\neg(\neg A \vee \neg B)$
T	F	T	F			
T	F	F	T			
F	T	T	F			
F	T	F	T			

Conclusion: Negations / Not negations

Question 12

Complete the truth table below to determine whether $\neg C \wedge D$ and $C \vee \neg D$ are negations of each other.

C	$\neg C$	D	$\neg D$	$\neg C \wedge D$	$C \vee \neg D$	$\neg(C \vee \neg D)$
T	F	T	F			
T	F	F	T			
F	T	T	F			
F	T	F	T			

Conclusion: Negations / Not negations

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Question 13

Complete the truth table below to determine whether $E \vee F$ and $\neg E \wedge \neg F$ are negations of each other.

E	$\neg E$	F	$\neg F$	$E \vee F$	$\neg E \wedge \neg F$	$\neg(\neg E \wedge \neg F)$
T	F	T	F			
T	F	F	T			
F	T	T	F			
F	T	F	T			

Conclusion: Negations / Not negations

Question 14

Complete the truth table below to determine whether $\neg G \vee H$ and $G \wedge \neg H$ are negations of each other.

G	$\neg G$	H	$\neg H$	$\neg G \vee H$	$G \wedge \neg H$	$\neg(G \wedge \neg H)$
T	F	T	F			
T	F	F	T			
F	T	T	F			
F	T	F	T			

Conclusion: Negations / Not negations

Question 15

Complete the truth table below to determine whether $I \wedge \neg J$ and $\neg I \vee J$ are negations of each other.

I	$\neg I$	J	$\neg J$	$I \wedge \neg J$	$\neg I \vee J$	$\neg(\neg I \vee J)$
T	F	T	F			
T	F	F	T			
F	T	T	F			
F	T	F	T			

Conclusion: Negations / Not negations

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Question 16

Complete the truth table below to determine whether $K \wedge L$ and $\neg K \wedge \neg L$ are negations of each other.

K	$\neg K$	L	$\neg L$	$K \wedge L$	$\neg K \wedge \neg L$	$\neg(\neg K \wedge \neg L)$
T	F	T	F			
T	F	F	T			
F	T	T	F			
F	T	F	T			

Conclusion: Negations / Not negations

Question 17

Complete the truth table below to determine whether $\neg M \wedge N$ and $M \vee N$ are negations of each other.

M	$\neg M$	N	$\neg N$	$\neg M \wedge N$	$M \vee N$	$\neg(M \vee N)$
T	F	T	F			
T	F	F	T			
F	T	T	F			
F	T	F	T			

Conclusion: Negations / Not negations

Question 18

Complete the truth table below to determine whether $O \vee \neg P$ and $\neg O \vee P$ are negations of each other.

O	$\neg O$	P	$\neg P$	$O \vee \neg P$	$\neg O \vee P$	$\neg(\neg O \vee P)$
T	F	T	F			
T	F	F	T			
F	T	T	F			
F	T	F	T			

Conclusion: Negations / Not negations

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Question 19

Complete the truth table below to determine whether $\neg Q \vee \neg R$ and $Q \wedge \neg R$ are negations of each other.

Q	$\neg Q$	R	$\neg R$	$\neg Q \vee \neg R$	$Q \wedge \neg R$	$\neg(Q \wedge \neg R)$
T	F	T	F			
T	F	F	T			
F	T	T	F			
F	T	F	T			

Conclusion: Negations / Not negations

Question 20

Complete the two truth tables below to determine whether the following statements are negations of each other.

You guessed every question and did not survive the worksheet.

You did not guess any question, or you survived the worksheet.

Gessed every question	Did not guess any question	Survived the worksheet	Did not survive the worksheet	Gessed every question and did not survive the worksheet
T	T	T		
T	T	F		
T	F	T		
T	F	F		
F	T	T		
F	T	F		
F	F	T		
F	F	F		

Gessed every question	Did not guess any question	Survived the worksheet	Did not guess any question, or survived the worksheet	It is not the case that the previous statement is true
T	T	T		
T	T	F		
T	F	T		
T	F	F		
F	T	T		
F	T	F		
F	F	T		
F	F	F		

Conclusion: Negations / Not negations