Submission 1.1

Remember to grade me nice or mr bailey will hurt yours

1 Problem 1

I think they both have to be knights because that is the only way that the person talking is telling the truth. If the "he" in this problem is a knight, then so is the person talking. If the person talking is a knave, then the "he" and the person talking are both knaves, in which they would both be lying and they are actually knights because knaves always lie.

2 Problem 2

2.1 (a)

He went to King's Pyland or Mapleton
He is not at King's Pyland

He is at Mapleton

2.2 (b)

Valid:Yes, Sound: Yes

2.3 (c)

KP∨M
¬KP

∴M

3 Problem 3

3.1 (a)

The patient dies or we operate
We will operate

The patient won't die

3.2 (b)

Valid:Yes, Sound: Yes

3.3 (c)

O $\implies$ $\neg$P
O

$\therefore \neg$P

3.4 (d)

P	O	$O \implies \neg P$
T	T	F
T	F	T
F	T	$T\checkmark$
F	F	F

4 Problem 4

4.1 (a)

If I'm right, then I'm a fool
If I'm a fool, then I'm not right

I'm not a fool

4.2 (b)

Valid: No, Sound: No

4.3 (c)

R $\implies$ F
F $\implies$ $\neg$R

$\therefore \neg$F

5 Problem 5

5.1 (a)

If I'm right, then I'm a fool
If I'm a fool, then I'm not right

I'm not a fool

5.2 (b)

Valid: Yes, Sound: HTD (Hard to determine)

5.3 (c)

R $\implies$ F
F $\implies$ $\neg$R

$\therefore \neg$R

5.4 (d)

R	F	$R \implies F$	$F \implies \neg R$
T	T	T	F
T	F	F	T
F	T	T	T✓
F	F	T	T✓

6 Problem 6

6.1 (a)

If Einstein's Theory of Relativity is correct, then light bends around the sun
Light bends around the sun

Einstein's Theory of Relativity is correct

6.2 (b)

Valid: No, Sound: No

6.3 (c)

E $\implies$ B
B

$\therefore$E

7 Problem 7

7.1 (a)

Congress will cut if the president announces his support first
The president won't announce his support first

Congress won't cut

7.2 (b)

Valid: No, Sound: No

7.3 (c)

S $\implies$ C
$\neg$S

$\therefore \neg$C

7.4 (d)

S	C	$S \implies C$	$\neg S$
T	T	T	F
T	F	F	F
F	T	T	T✓
F	F	T	T✓

8 Problem 8

8.1 (a)

If you are ambitious, you won't achieve goals
Life has meaning if you have ambition

If you achieve all your goals, life has no meaning

8.2 (b)

Valid: Yes, Sound: No

8.3 (c)

A $\implies \neg$G
M $\implies$ A

$\therefore$G $\implies \neg$M

9 Problem 9

9.1 (a)

If Adams wins the election, then Brown will retire to a private life
If Brown dies before the election, then Adams will win it

If Brown dies before the election, he will retire to a private life

9.2 (b)

Valid: Yes, Sound: No

9.3 (c)

W $\implies$ P
D $\implies$ W

$\therefore$D $\implies$ P

9.4 (d)

W	P	D	$W \implies P$	$D \implies W$
T	T	T	T	$T\checkmark$
T	T	F	T	$T\checkmark$
T	F	T	F	T
T	F	F	F	T
F	T	T	T	F
F	T	F	T	$T\checkmark$
F	F	T	T	F
F	F	F	T	$T\checkmark$

10 Problem 10

10.1 (a)

Holmes is right and Moriarity is guilty or Holmes is wrong and Thin is guilty
Both are guilty or both are innocent
Holmes is right

Thin is guilty

10.2 (b)

Valid: Yes, Sound: Yes

10.3 (c)

(H$\wedge$M)$\vee$($\neg$H$\wedge$T
H
(T$\wedge$M)$\vee$($\neg$T$\wedge\neg$M)

$\therefore$T

11 Problem 11

11.1 (a)

Mittens meows when hungry
Mittens is meowing but isn't hungry

The end of the Earth is at hand

11.2 (b)

Valid: Yes, Sound: No

11.3 (c)

H $\implies$ M
M$\wedge\neg$H

$\therefore$E

11.4 (d)

H	M	$H \implies M$	$M \wedge \neg H$
T	T	T	F
T	F	F	F
F	T	F	T
F	F	F	F

12 Problem 12

12.1 (a)

God is omnipotent if and only if he can do everything
If he can't make a stone so heavy he can't lift it, then he can't do everything
If he can make a stone so heavy he can't lift it, then he can't do everything

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God is not omnipotent or does not exist

12.2 (b)

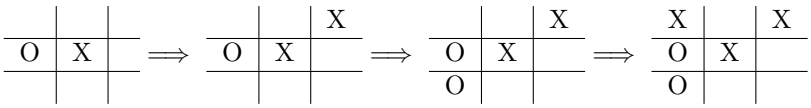
Valid: Yes, Sound: HTD

12.3 (c)

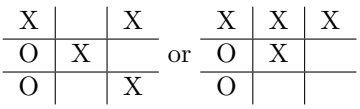
O$\rightleftharpoons$E
$\neg$S $\implies$ $\neg$E
S $\implies$ $\neg$E

$\therefore \neg O \vee \neg X$

13 Problem 13



Then,



14 Problem 14

False, you can.

If I'm right, then I'm a fool
If I'm a fool, then I'm not right
If I'm not right, then I'm a fool
If I'm not right, then I'm not a fool

I'm not a fool

15 Problem 15

F $\Longrightarrow$ F = valid
F $\Longrightarrow$ T = valid
T $\Longrightarrow$ T = valid
T $\Longrightarrow$ F = invalid

If the premises are all true and the conclusion is false, then no matter what premises you remove, the statement is still a tautology, and so the premises will remain true while the conclusion remains false.

16 Problem 16

A, B / C is contingent in some of the same ways, with the addition that it is a valid argument if A and B contradict.

17 Problem 17

With respect to my last explanation, there is no way to ensure that $(A \wedge B) \implies C$ is also valid because A and B could have a contradiction.

18 Problem 18

False, your conclusion can be anything if your premises contradict because there can be no case in which your premises are true and your conclusion is false, so it is impossible to prove invalid.

19 Problem 19

This means that $A \wedge B \wedge C$ can never be true because inconsistency means that there is no case in which all the premises are true.

20 Problem 20

As long as the statement's premises are a contradiction, it can still be a valid argument because it doesn't matter what the conclusion is, because a contradiction in the premises allows you to claim anything and the argument is still valid.