

4) (5 points each) Let p and q be true statements and let r be a false statement. Show the work to determine the truth value of the given compound statement:

a) $p \wedge \sim q$

$$T \wedge \sim T$$

$$T \wedge F$$

$$\textcircled{F}$$

b) $(p \vee q) \leftrightarrow \sim r$

$$\underbrace{(T \vee T)} \leftrightarrow \sim F$$

$$T \leftrightarrow T$$

$$\textcircled{T}$$

5) (5 points each) Negate the following statements:

a) I'll be back.

I won't be back
↳ "will not"

b) I am serious and don't call me Shirley.

I am not serious or
call me Shirley.

c) If you build it, he will come.

You build it and
he will not come.

d) Nobody puts Baby in a corner.

Somebody puts Baby
in a corner.

6) (3 points each) For the statement "All that glitters is gold", write it first as an if-then statement, then find the converse, inverse, and contrapositive:

If-then: If it glitters, then it is ~~not~~ gold.

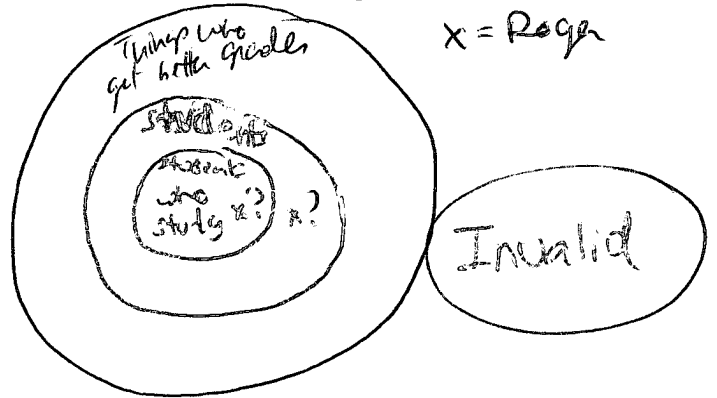
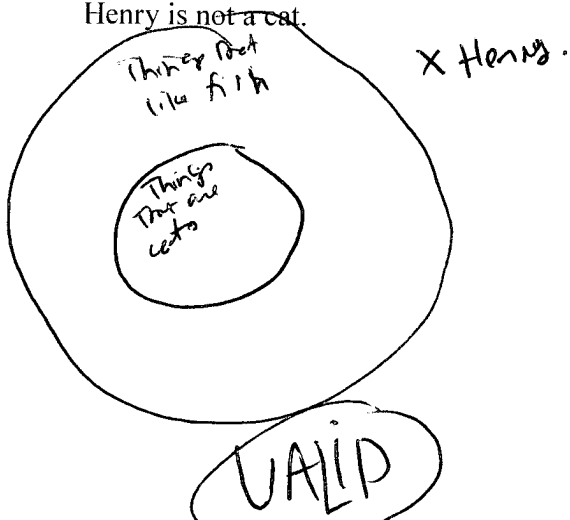
Converse: If it is gold, then it glitters.

Inverse: If it does not glitter, then it is not gold.

Contrapositive: If it is not gold, then it does not glitter.

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- 7) (7 points each) Use an Euler diagram to determine whether the argument is valid or invalid:
- a) All cats like fish.
Henry does not like fish.
Henry is not a cat.
- b) All students who study get better grades.
Rodger is a student.
Rodger will get better grades.



- 8) (14 points) Use a truth table to determine whether the argument is valid: $\frac{p \rightarrow q}{q \vee r}$. Be sure to label the columns!
- $r \rightarrow p$

Invalid!

p	q	r	$p \rightarrow q$	$q \vee r$	$(p \rightarrow q) \wedge (q \vee r)$	$r \rightarrow p$	$(p \rightarrow q) \wedge (q \vee r) \rightarrow (r \rightarrow p)$
T	T	T	T	T	T	T	T
T	T	F	T	T	T	T	T
T	F	T	F	T	F	T	T
T	F	F	F	F	F	T	T
F	T	T	T	T	T	F	F
F	T	F	T	T	T	T	T
F	F	T	T	T	T	F	F
F	F	F	T	F	F	T	T

- 9) (One point per movie) Extra credit: Give the name of the movie where each quote from Problem 5 came from. Be sure to label your answers.

- A) Terminator
- b) Airplane!
- c) Field of Dreams
- d) Dirty Dancing

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