Name:_____

NetID:_____ **Lecture: A B**

Discussion: Thursday Friday 10 11 12 1 2 3 4 5 6

1. (5 points) State the negation of the following claim, moving all negations (e.g. "not") so that they are on individual predicates.

John has a camera and there is a Meerkat m, such that m lives in New York and John has not photographed m

2. (5 points) State the contrapositive of the following claim, moving all negations (e.g. "not") so that they are on individual predicates.

For every violin v, if v is old or the maker of v is not known, then v is not valuable.

3. (5 points) Suppose that x is an integer and $x^2 + 3x - 18 < 0$. What are the possible values of x? Show your work.

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Discussion: Thursday Friday 10 11 12 1 2 3 4 5 6

1. (5 points) State the negation of the following claim, moving all negations (e.g. "not") so that they are on individual predicates.

For every Meerkat m, if m is in New York, then m is not in the wild or m is lost.

2. (5 points) Solve $\frac{3}{x} + m = \frac{3}{p}$ for x, expressing your answer as a single fraction. Simplify your answer and show your work.

3. (5 points) State the contrapositive of the following claim, moving all negations (e.g. "not") so that they are on individual predicates.

For every dinosaur d, if d is small and d is not a juvenile, then d is not a sauropod.

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Discussion: Thursday Friday 10 11 12 1 2 3 4 5 6

1. (5 points) Show that the following two expressions are not logically equivalent, by giving specific values of p, q for which they produce different values.

$p \to (q \to p)$

$(p \to q) \to p$

2. (5 points) State the negation of the following claim, moving all negations (e.g. "not") so that they are on individual predicates.

For every cat c, if c is not fierce or c wears a collar, then c is a pet.

3. (5 points) Suppose that k is a positive integer, x is a positive real number, and $\frac{1}{k} = x + \frac{1}{6}$. What are the possible values for k? (Hint: k is an INTEGER.) Briefly explain or show work.

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1. (5 points) State the negation of the following claim, moving all negations (e.g. "not") so that they are on individual predicates.

If it is raining, then there is a cyclist c such that c is getting wet.

2. (5 points) Describe all (real) solutions to the equation $2p^2 + p - 6 < 0$. Show your work.

3. (5 points) Give a truth table for the following expression and (using your truth table or other means) find a simpler expression equivalent to it.

$(r \to q) \to r =$

q	r	$r \to q$	$(r \to q) \to r$
T	T		
T	F		
F	T		
F	F		

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1. (5 points) Give a truth table for the following expression and (using your truth table or other means) find a simpler expression equivalent to it.

$(p \wedge q) \vee q =$

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

2. (5 points) State the contrapositive of the following claim, moving all negations (e.g. "not") so that they are on individual predicates.

For every elephant e, if e likes to dance and e has good taste, then e likes Juluka.

3. (5 points) Solve $\frac{x}{2} - 1 < 3x + 9$ for x. (Assume x is real.) Show your work.

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Discussion: Thursday Friday 10 11 12 1 2 3 4 5 6

1. (5 points) State the negation of the following claim, moving all negations (e.g. "not") so that they are on individual predicates.

For every violin v, if v is old or the maker of v is not known, then v is not valuable.

2. (5 points) Suppose that f and g are functions whose inputs and outputs are real numbers, defined by $f(x) = x^2 - 1$ and $g(x) = \frac{x}{2}$. Compute the value of $g(f(y + 1)))$, showing your work.

3. (5 points) State the contrapositive of the following claim, moving all negations (e.g. "not") so that they are on individual predicates.

For every garbage can c, if c was supplied by the city, then c is small or c has wheels.