

CS 173, Fall 2015
Examlet 1, Part A

NETID:

FIRST:

LAST:

Discussion: Thursday 2 3 4 5 Friday 9 10 11 12 1 2

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 computer game g , if g has trendy music or g has an interesting plotline, then g is not cheap.

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 book b , if b is blue or b is not heavy, then b is not a math book.

3. (5 points) Solve $3x + 2m = \frac{w}{y}$ for x , expressing your answer as a single fraction. Show your work.

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For every dragon d , if d is green, then d is not large or d is fat.

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 book b , if b is blue or b is not heavy, then b is not a math book.

3. (5 points) Suppose that G and H are functions whose inputs and outputs are real numbers, defined by $G(x) = x + 7$ and $H(x) = \sqrt{x - 1}$. Compute the value of $G(H(H(2)))$, showing your work.

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

For any student s , if s rides a bicycle, then s wears a helmet or s has no fear of death.

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 tree t , if t grows in Canada, then t is not tall or t is a conifer.

3. (5 points) Solve $\frac{4p^2 - 9}{2p + 3} = 5$ for p . Show your work.

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For any student s , if s rides a bicycle, then s wears a helmet or s has no fear of death.

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

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.

There is a dorm room d , such that d has green walls and d has no window.

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 tree t , if t grows in Canada, then t is not tall or t is a conifer.

3. (5 points) Suppose that m and p are positive integers such that $2p^2 + mp < 6$. What are the possible values for m ? Briefly explain or show work.

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

For any bear b , if b is blue and b talks, then b is fuzzy.

3. (5 points) Suppose that G and H are functions whose inputs and outputs are real numbers, defined by $G(x) = x - 5$ and $H(x) = \sqrt{x + 1}$. Compute the value of $H(H(G(13)))$, showing your work.

2. (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.

$$r \rightarrow (q \rightarrow r) =$$

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