

Lab for Sections 3.1

Name _____

Use good notation and show appropriate work.

1. Determine whether the following statements are true or false. Also, symbolize each statement.

_____ (a) Our Math 102 classroom has a chalkboard and our Math 102 book is paperback.

_____ (b) Our Math 102 classroom has a chalkboard or our Math 102 book is paperback.

_____ (c) Joe Biden is Vice President of the United States or dogs have wings.

_____ (d) Fish swim and birds fly, or clouds are made out of Helium.

_____ (e) The Minnesota Twins are a baseball team or the MSUM mascot is a dragon.

_____ (f) Humans are amphibians, and squirrels are mammals or lizards are reptiles.

_____ (g) Humans are amphibians and squirrels are mammals, or lizards are reptiles.

_____ (h) Humans are not amphibians and squirrels are mammals, or lizards are not reptiles.

_____ (i) Humans are amphibians, and squirrels are mammals or lizards are not reptiles.

_____ (j) Humans are not amphibians, and squirrels are not mammals or lizards are not reptiles.

_____ (k) Humans are not amphibians, and squirrels are not mammals or lizards are reptiles.

2. Consider the following statements. Let s represent "There is school today", d represent "It is Saturday", and t represent "I have a test today".

Use these to translate each of the following symbolic forms into statements.

(a) $s \wedge \sim d$

(b) $d \rightarrow \sim s$

(c) $\sim (t \vee d)$

(d) $s \rightarrow (\sim d \wedge t)$

4. For each of the statements below, write the *negation* of the statement in English words in two ways:
(1) using the “it is not true that” method and then
(2) using the precise quantifier language studied in class.

(a) All professors have graduate degrees.

(1)

(2)

(b) Some students study at least 5 hours the day before an exam.

(1)

(2)

(c) Some cars are not red.

(1)

(2)

5. Determine whether each pair of statements is consistent or inconsistent.

(a) Some days are sunny.
No day is sunny.

(b) Some days are sunny.
All days are sunny.

(c) Some days are sunny.
Some days are not sunny.

(d) No sunny time is a day.
Some days are sunny.