

Logic: Statements & Quantifiers
SOLUTIONS

1. Decide whether each is a statement or is not a statement.
 - (a) Listen, my children, and you shall hear, of the midnight ride of Paul Revere.
Not a statement
 - (b) Coffee contains caffeine.
Statement
 - (c) $4 + 5 = 3$
Statement
 - (d) Cleveland is the capital of the United States.
Statement
 - (e) Do you like the Patriots?
Not a statement
 - (f) Come here, now.
Not a statement

2. Negate each of the following statements
Solutions may vary
 - (a) All children like candy.
Atleast one child does not like candy.
 - (b) Some people enjoy math.
Nobody enjoys math
 - (c) Everybody enjoys naps.
Atleast one person does not enjoy naps.
 - (d) Atleast one person can play poker.
Nobody can play poker.

3. Let p represent the statement "It will rain today", and q represent the statement "I will wear a hat". Convert each symbolic compound statement into words.
 - (a) $p \vee q$
It will rain today or I will wear a hat.
 - (b) $p \wedge \sim q$
It will rain today and I will not wear a hat.
 - (c) $\sim (p \wedge q)$
It is not the case that it will rain today and I will wear a hat.
 - (d) $\sim p \vee \sim q$
It will not rain today or I will not wear a hat.

4. Let p represent the statement "David has a dog" and q represent the statement "Pat enjoys math." Convert each compound statement into symbols.

(a) David has a dog or Pat enjoys math.

$$p \vee q$$

(b) David does not have a dog and Pat enjoys math.

$$\sim p \wedge q$$

(c) Neither David has a dog, nor Pat enjoys math.

$$\sim p \wedge \sim q$$

(d) It is not true that David does not have a dog and Pat does not enjoy math.

$$\sim (\sim p \wedge \sim q)$$