**Math 116: Written Homework Set 10**

**This assignment is due on Wednesday, November 16th in class. Show all work where possible! Answers magically appearing will receive no credit.**

1. Use one of De Morgan’s laws to write the given statement in an equivalent form.

 a. Roses have thorns.

 b. Carnations with long stems.

 c. Daffodils or tulips?

 d. Don’t eat the roses.

1. Use a truth table to determine the validity of the following argument.

 $p \rightarrow q$
 $\~p$
 ---------
 $\~q$

2. Symbolize the following arguments and use a truth table to determine its validity.

1. If Jane is short, then she eats bacon with a spoon.

Jane eats bacon with a spoon.
----------------------------------------------------------

 Therefore, Jane is short.

1. Mary is either sweet or clever.

 Mary is clever.
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 Therefore, Mary is not sweet.

1. If I don’t get up, I’ll never get going.

 I get up.
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 Therefore, I get going.

3. Negate the following sentences.

 a. All fish live in trees.

 b. Some fish do not live in trees.

 c. No trees grow under water.
 d. Some presidents are well-liked.

4. Rewrite the sentence “All of John’s friends are nerds” as a conditional.

 a. $\~p ⋀ q$
 b. $p ⋁ \~q$
 c. $\~p \rightarrow \~q$

 d. $(p ⋀ \~q)\rightarrow (\~p ⋀ q)$

**Selected Answers**

1. a. Is a statement.
 c. Not a statement. Is a question.

2. a. $p ⋁ q$
 c. $\~p \rightarrow q$

|  |
| --- |
| $$\~p ⋀ q$$ |
| F |
| F |
| T |
| F |

 3. a.

|  |
| --- |
| $$\~p \rightarrow \~q$$ |
| T |
| T |
| F |
| T |

 c.