ANSWER KEY

Relational and Logical Operators

INSTRUCTIONS: This is a rare homework assignment in which you are NOT going to use MATLAB at all. Please print this document out and fill it in using pencil or pen. When you are finished, type in your answers into the answer sheet on the last page. When you upload your assignment to D2L upload ONLY the answers page, not the rest of this document.

Part I

This is ungraded but will help you. Fill in the table below.

INPUT		OUTPUT				
A	**B**	**AND A&B**	**OR A|B**	**XOR(A,B)**	**NOT ~A**	**NOT ~B**
False	False	FALSE	FALSE	FALSE	TRUE	TRUE
False	True	FALSE	TRUE	TRUE	TRUE	FALSE
True	False	FALSE	TRUE	TRUE	FALSE	TRUE
True	True	TRUE	TRUE	FALSE	FALSE	FALSE

Part II

Now let's combine those logical and rational expressions and start to figure out how they work together. Look at each of these logic problems and figure out what the answer will be. In each case it will be either (1) True or (0) False. DO NOT TRY THEM OUT IN MATLAB UNTIL YOU HAVE YOUR ANSWERS DOWN! Remember NO COPY AND PASTE!

Problems

```
% Defined constants
smart=29; dumb=-299; dogs = 22/7; cats = 25/9; root = 23-2;
yes=1; no=0;
```

1. `>> answer1 = (1 < 2) & (smart > dumb)`

TRUE AND TRUE = TRUE

2. `>> answer2 = root - 2 > root & root > 0`

19 > 21

FALSE AND TRUE = FALSE

3. `>> answer3 = 1 == 1 & 2 == 1`

TRUE AND FALSE = FALSE

4. `>> answer4 = 1 == yes | 2 ~= 1`

TRUE OR TRUE = TRUE

5. `>> answer5 = 1 & 1 == 1`

TRUE AND TRUE = TRUE

6. `>> answer6 = cats > dogs` (and → &) `no ~= 0`

FALSE AND FALSE = FALSE

7. `>> answer7 = 1 | 1 == 1`

TRUE OR TRUE = TRUE

8. >> answer8 = 1 ~= 0 & 2 == 1

TRUE AND FALSE = FALSE

9. >> answer9 = ~(1 & 0)

NOT(TRUE AND FALSE) = TRUE

10. >> answer10 = ~(answer1 == 1 & 0 ~= 1)

NOT(TRUE AND TRUE) = FALSE

11. >> answer11 = 3 == 3 & (~ (42 == 21 * 2 | 65-2 == 65 + 3))

TRUE AND NOT (TRUE OR FALSE) = FALSE

12. >> answer 12 = cats <= dogs & (~ (answer1 == 1 | answer1 == answer6))

TRUE AND NOT (TRUE OR FALSE) = FALSE

13. >> answer13 = root == cats | cats <= dogs & dogs == dogs

FALSE OR TRUE AND TRUE = TRUE

14. >> answer14 = xor(yes,no)

TRUE

15. >> answer15 = xor(yes,yes) | yes == 1

FALSE OR TRUE = TRUE

16. >> answer16 = yes & yes == yes | no == ~yes

TRUE AND TRUE OR TRUE = TRUE

17. >> answer17 = yes & yes | no & yes & xor(yes,no)

TRUE OR FALSE AND TRUE = TRUE

Answer Sheet

Name:

Problem #	Answer: write 0 or 1
1	1
2	0
3	0
4	1
5	1
6	0
7	1
8	0
9	1
10	0
11	0
12	0
13	1
14	1
15	1
16	1
17	1