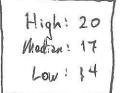Show all work needed to reach your answers.

1. (5 points) Which of the following is a statement (S), which is a predicate (P), and which is neither (N) (because it is ambiguous).

1pt. each

(a) __S__ The 10^{47}th digit of π is 3.

(b) __P__ $y = x$

(c) __S__ $x = x$ (True $\forall x$)

(d) __S__ All functions are continuous.

(e) __N__ All functions are ugly when written in MS Word. (Matter of Opinion.)

High: 20
Median: 17
Low: 14

1 pt. each

2. (10 points) Please complete the following truth table.

A	B	C	$A \wedge B$	$\sim C$	$\sim (A \Rightarrow B)$	$(C \wedge (\sim A)) \wedge B$	$(A \Rightarrow (B \vee C)) \Leftrightarrow ((A \vee (\sim B)) \Rightarrow C)$
F	T	T	F	F	F	T	T
T	T	F	T	T	F	F	F

3. (5 points) Please negate the following statements:

2 (a) "Some functions are discontinuous."

All functions are continuous.

3 (b) "If a positive integer n is even, then n is not divisible by 3."

$\exists$ an even positive integer n such that n is divisible by 3.