9. Is the argument below valid or invalid?

The program is interesting or I will watch the basketball game.
The program is not interesting.
Therefore, I will watch the basketball game.

$P \to Q$, $\sim P$, $\therefore Q$

A) The argument is valid.
B) The argument is invalid.

TRUTH TABLE: $[(P \to Q) \wedge \sim P] \to Q$

P	Q	~P	$(P \to Q)$	$[(P \to Q) \wedge \sim P]$	$[(P \to Q) \wedge \sim P] \to Q$
T	T	F	T	F	T
T	F	F	F	F	T
F	T	T	T	T	T
F	F	T	T	F	F

10. Is the argument below valid or invalid?

If you go to the game, then you will have a great time.
You went to the game.
Therefore, you had a great time.

A) The argument is valid by modus ponens.
B) The argument is invalid by inverse fallacy.
C) The argument is valid by modus tollens.
D) The argument is invalid by converse fallacy.
E) None of these

$(P \to Q)$, P, $\therefore Q$ — MODUS PONENS (NOTES)

11. Given T = {-10, -6, 0, 4, 15}. Which of the following statements is true?

i. $\forall x \in T, x \geq -10$
ii. $\forall x \in T, x < 15$.
iii. $\forall x \in T, x \geq -10 \vee x < -10$.

A) All of the above are true.
B) Only i and ii are true.
C) Only i is true.
D) None of these are true.
E) Only i and iii are true.

12. Given T = {2, 4, 6, 8, 10, 12} and the predicate P(x) is "x > 2 and x is odd". Find the values $x \in T$ that are true for the negation of P(x).

$x \leq 2$ OR x IS EVEN

A) 2, 4, 6
B) 2
C) 4, 6, 8, 10, 12
D) None of the values of T is true.
E) All of the values of T are true.

13. Let R be the set of Republicans senators and let *O(x)* be the predicate "x are senators that support President Obama." Write the ***negation*** of statement below using quantifiers.

Given statement: "All Republican senators do not support President Obama."

A) $\forall x \in R, O(x)$
B) $\forall x \in R, \neg O(x)$
C) $\exists x \in R, \neg O(x)$
D) $\exists x \in R, O(x)$
E) None of these

SOME REP. SENATORS THAT DO SUPPORT OBAMA.

14. Identify the argument below as valid or invalid.

If you score a touchdown, then you will get $20. $P \rightarrow Q$
You did not score a touchdown. $\sim P$
Therefore, you did not score $20. $\therefore \sim Q$

A) This argument is valid as a modus ponens argument.
B) The argument is valid as a modus tollens argument.
C) The argument is invalid because it is a converse fallacy.
D) The argument is invalid because it is an inverse fallacy.

15. Write the following implication as a universally quantified statement.

If x is a prime number, then it is divisible by 1.

A) Some prime numbers are divisible by 1.
B) All prime numbers are not divisible by 1.
C) All prime numbers are divisible by 1.
D) No prime numbers are divisible by 1.

16. Which statement is logically equivalent to:

x is not an odd number and y is an even number.

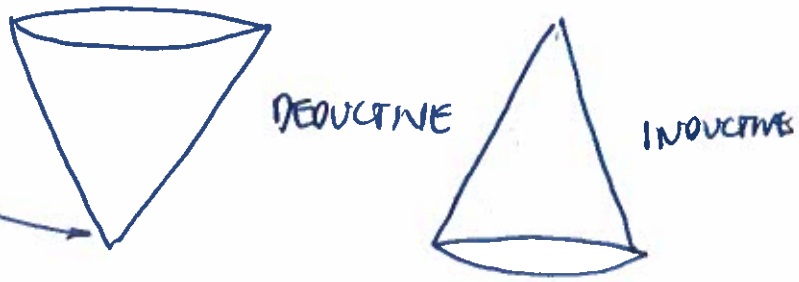
A) x is an even number or y is an odd number.
B) x is an odd number and y is an odd number.
C) x is an even number and y is an odd number.
D) x is an even number or y is an odd number.
E) None of these.

X IS ODD OR Y IS NOT AN EVEN NUMBER.

17. Given the set of statements below, determine if the logic displayed is deductive or inductive reasoning.

All x's are y's.
2 is an x.
Therefore, 2 is a y.

A) Inductive Reasoning
B) Deductive Reasoning.
C) Neither of these.



18. What would be the value of the truth table (last column) for $\neg(p \rightarrow \neg q) \vee \neg r$

A) FFFFFFFF
B) FTFFFFFT
C) FTFFFFFF
D) FTFFFFTT
E) None of these

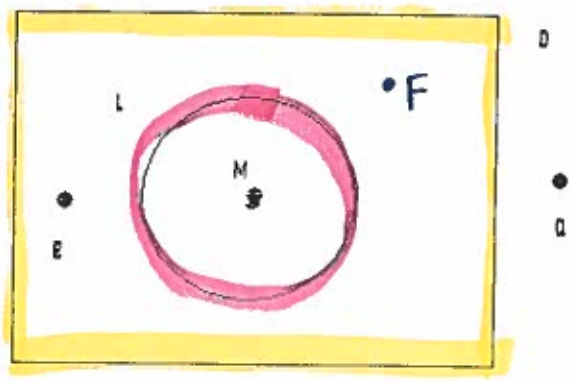
19. If p is given as any true statement, q is given as any false statement, and r is given as any true statement, what is the truth value of: $\neg(p \rightarrow \neg q) \wedge (\neg r \rightarrow p)$?

$\sim(T \rightarrow T) \wedge (F \rightarrow T)$
$\sim T \wedge T$
$F \wedge T$

A) True
B) False
C) Cannot tell from the information provided.

P	Q	R	~Q	~R	(P→~Q)	~(P→~Q)	~(P→~Q) V ~R
T	T	T	F	F	F	T	T
T	T	F	F	T	F	T	T
T	F	T	T	F	T	F	F
T	F	F	T	T	T	F	T
F	T	T	F	F	T	F	F
F	T	F	F	T	T	F	T
F	F	T	T	F	T	F	F
F	F	F	T	T	T	F	T

20. Given the following argument and Venn Diagram, what can be concluded?



Given: $\forall x \in L, D(x)$ where L is the set of dogs that liked to be walked on a leash and D(x) is the predicate "the set of dogs."

A) M likes to be walked on a leash.
B) B does not like to be walked on a leash, but is a dog.
C) Q is not a dog.
D) Some dogs do not like to be walked on a leash.
E) All of these.