

Logic

Decide whether or not the following is a statement.

- 1) Not all flowers are roses. 1) _____
A) Statement B) Not a statement
- 2) $0.2 = .02$ 2) _____
A) Statement B) Not a statement
- 3) This test is too hard. 3) _____
A) Not a statement B) Statement

Write a negation for the statement.

- 4) No fifth graders play soccer. 4) _____
A) All fifth graders play soccer. B) No fifth grader does not play soccer.
C) At least one fifth grader plays soccer. D) Not all fifth graders play soccer.
- 5) Not all people like football. 5) _____
A) Some people like football. B) All people do not like football.
C) Some people do not like football. D) All people like football.

Convert the symbolic compound statement into words.

- 6) p represents the statement : " $x < 1$ " 6) _____
 q represents the statement: " $y > 1$ "
Translate the following compound statement into words:
 $p \vee \sim q$
- A) x is less than 1 and y is not greater than 1. B) x is not less than 1 and y is not less than 1.
C) x is less than 1 or y is not greater than 1. D) x is less than 1 or y is less than 1.

Let p represent the statement, "Jim plays football", and let q represent the statement "Michael plays basketball". Convert the compound statement into symbols.

- 7) It is not the case that Jim does not play football and Michael does not play basketball. 7) _____
A) $\sim(p \vee q)$ B) $\sim p \wedge \sim q$ C) $\sim(\sim p \vee \sim q)$ D) $\sim(\sim p \wedge \sim q)$
- 8) Jim does not play football or Michael does not play basketball. 8) _____
A) $\sim(p \vee q)$ B) $\sim p \vee \sim q$ C) $\sim p \wedge \sim q$ D) $p \wedge q$
- 9) Jim plays football and Michael plays basketball. 9) _____
A) $\sim p \wedge q$ B) $p \wedge q$ C) $p \vee \sim q$ D) $p \vee q$

Let p represent a true statement and let q represent a false statement. Find the truth value of the given compound statement.

- 10) $p \wedge (q \vee p)$ 10) _____
A) False B) True

11) $[(\sim p \wedge \sim q) \vee \sim q]$ 11) _____
 A) False B) True

12) $\sim[(\sim p \wedge \sim q) \vee \sim q]$ 12) _____
 A) False B) True

Let p represent a true statement, while q and r represent false statements. Find the truth value of the compound statement.

13) $\sim[(\sim p \wedge q) \vee r]$ 13) _____
 A) True B) False

Let p represent $7 < 8$, q represent $2 < 5 < 6$, and r represent $3 < 2$. Decide whether the statement is true or false.

14) $\sim(\sim p \wedge \sim q) \wedge (\sim r \wedge \sim q)$ 14) _____
 A) True B) False

Construct a truth table for the statement.

15) $\sim s \vee (\sim p \vee s)$ 15) _____

A)

s	p	$\sim s \vee (\sim p \vee s)$
T	T	T
T	F	F
F	T	T
F	F	T

B)

s	p	$\sim s \vee (\sim p \vee s)$
T	T	F
T	F	F
F	T	T
F	F	T

C)

s	p	$\sim s \vee (\sim p \vee s)$
T	T	F
T	F	T
F	T	T
F	F	T

D)

s	p	$\sim s \vee (\sim p \vee s)$
T	T	T
T	F	T
F	T	T
F	F	T

Use De Morgan's laws to write the negation of the statement.

16) Denim is out and linen is in. 16) _____
 A) Denim is not out or linen is not in. B) Denim is not out and linen is out.
 C) Denim and linen are in. D) Denim is in and linen is out.

Rewrite the statement using the if...then connective. Rearrange the wording or words as necessary.

17) All children like stuffed toys. 17) _____
 A) If it is a child, then it likes stuffed toys.
 B) If it is not a stuffed toy, then children like it.
 C) If children like it, then it's a stuffed toy.
 D) All children like stuffed toys.

Tell whether the conditional statement is true or false.

18) Here T represents a true statement. 18) _____
 $T \rightarrow (5 < 3)$
 A) True B) False

19) $(52 \neq 25) \rightarrow (2 + 3 = 5)$ 19) _____
 A) True B) False

Write the compound statement in symbols.

Let r = "The food is good."

p = "I eat too much."

q = "I'll exercise."

20) If the food is good and I eat too much, then I'll exercise.

A) $r \wedge (p \rightarrow q)$

B) $(r \wedge p) \rightarrow q$

C) $p \rightarrow (r \wedge q)$

D) $r \rightarrow (p \wedge q)$

20) _____

Given p is true, q is true, and r is false, find the truth value of the statement.

21) $\sim r \rightarrow \sim p$

A) True

B) False

21) _____

22) $(q \vee r) \rightarrow (p \wedge q)$

A) True

B) False

22) _____

Construct a truth table for the statement.

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

A)

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

T

T

F

T

F

F

F

T

T

F

F

F

C)

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

T

T

T

T

F

F

F

T

T

F

F

F

B)

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

T

T

T

T

F

T

F

T

T

F

F

F

D)

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

T

T

T

T

F

T

F

T

T

F

F

T

23) _____

Write the converse, inverse, or contrapositive of the statement as requested.

24) If I pass, I'll party.

Contrapositive

A) I'll party if I pass.

B) If I don't party, I didn't pass.

C) If I don't pass, I won't party.

D) If I party, then I passed.

24) _____

25) He who laughs last, laughs loudest.

Inverse

A) If he doesn't laugh last, he doesn't laugh loudest.

B) If he laughs last, he doesn't laugh loudest.

C) If he doesn't laugh loudest, he doesn't laugh last.

D) If he laughs loudest, he laughs last.

25) _____

Use an Euler diagram to determine whether the argument is valid or invalid.

26) Some TV shows are comedies.

All comedies are hits.

Some TV shows are hits.

A) Valid

B) Invalid

26) _____

27) No even number is divisible by 5.

30 is an even number.

30 is not divisible by 5.

A) Valid

B) Invalid

27) _____

The argument has a true conclusion. Identify the argument as valid or invalid.

28) All dogs have fur.

All cats have fur.

A cat is not a dog.

A) Valid

B) Invalid

28) _____

Determine if the argument is valid or a fallacy. Give a reason to justify answer.

29) If I'm hungry, then I will eat.

I'm not hungry.

I will not eat.

A) Valid by modus ponens

B) Fallacy by fallacy of the inverse

C) Valid by modus tollens

D) Fallacy by fallacy of the converse

29) _____

30) If it's Tuesday, then this must be Paris.

Today is Wednesday.

This cannot be Paris.

A) Valid by modus tollens

B) Valid by reasoning of transitivity

C) Fallacy by fallacy of the inverse

D) Fallacy by fallacy of the converse

30) _____

31) You get soup or you get salad.

You did not get soup.

You got salad.

A) Fallacy by fallacy of the converse

B) Valid by disjunctive syllogism

C) Fallacy by fallacy of the inverse

D) Valid by reasoning of transitivity

31) _____

32) If it rains, then the squirrels hide.

The squirrels are hiding.

It is raining.

A) Fallacy by fallacy of the converse

B) Valid by disjunctive syllogism

C) Fallacy by fallacy of the inverse

D) Valid by modus tollens

32) _____

Answer Key

Testname: REVIEW02

- 1) A
- 2) A
- 3) A
- 4) C
- 5) D
- 6) C
- 7) D
- 8) B
- 9) B
- 10) B
- 11) B
- 12) A
- 13) A
- 14) B
- 15) D
- 16) A
- 17) A
- 18) B
- 19) A
- 20) B
- 21) B
- 22) A
- 23) B
- 24) B
- 25) A
- 26) A
- 27) A
- 28) B
- 29) B
- 30) C
- 31) B
- 32) A