Which of the following statement is not a proposition? *

- 2+3=5
- 5+7=10
- x+2=10
- The only odd prime number is 2.

If p is any proposition, then which of the following is contingency? *

- $p \wedge \neg p$ F
- $p \vee \neg p$ T
- $\boxed{p \wedge p}$ $\boxed{T, F}$
- None of the above

Let P: I am in Bangalore. , Q: I love cricket. ; then q→p(q implies p) is: *

- ( ) If I love cricket then I am in Bangalore
- ( ) If I am in Bangalore then I love cricket
- ( ) If I am not in Bangalore then I don't love cricket
- ( ) If I don't love cricket then I am in Bangalore

$q \to p$ "If I love cricket then I am in Bangalore.

¬ (P → Q) is equivalent to *

- ( ) P∧ ¬ Q
- ( ) ¬q → ¬p
- ( ) q → p
- ( ) ¬q → p

$\sim(p \to q)$

$\sim(\sim p \lor q)$

$\sim(\sim p) \land \sim q$

$p \land (\sim q)$

Which of the following statement is not correct? *

- $p \vee q \equiv q \vee p$
- $\neg(p \wedge q) \equiv \neg p \vee \neg q$
- $(p \vee q) \vee r \equiv p \vee (q \vee r)$
- $\boxed{\neg p \wedge p = T}$

p → q is logically equivalent to: *

$p \to q \equiv \sim p \vee q$

- $\neg p \vee \neg q$
- $p \vee \neg q$
- $\boxed{\neg p \vee q}$ ✓
- $\neg p \wedge q$

Let $R(x, y)$ denotes the statement $x = y - 5$. Then, the truth values of the propositions $R(5,0)$ and $R(0,5)$ are respectively.

A. True and True
B. True and False
C. False and True
D. False and False

$R(x, y) : x = y - 5$

$R(5, 0) : 5 = 0 - 5 \Rightarrow 5 = -5$ (False)

$R(0, 5) : 0 = 5 - 5 \Rightarrow 0 = 0$ (True

How many rows will be there for the truth table of $p_1 \vee p_2 \vee p_3 \ldots \vee p_5$

A. 4
B. 8
C. 16
D. 32

$2^n = 2^5 = 32$

Let Q(x, y) denote the statement "y is the capital of x." What are these truth values? i) Q(Punjab, Chandigarh) ii) Q(India, New Delhi) iii) Q(Massachusetts, Boston) iv) Q(Florida, Miami) *

- T, F, T, F
- T, T, F, F
- T, T, F, T
- T, T, T, F

When to proof P→Q true, we proof P true and Q is also true then, what type of proof is this? *

- Direct proof
- Contrapositive proof
- Trivial proof
- vacuous proof

Which of the following statement is the negation of the statements "4 is odd or -9 is positive"?

- 4 is even or -9 is not negative
- 4 is odd or -9 is not negative
- 4 is even and -9 is negative
- 4 is odd and -9 is not negative

Which of the following theorem can't be proved using contrapositive proof?

Multiple choice

- If n is an integer and 4n + 5 is odd then n is odd.
- If n is an odd integer, then n^3 is odd.
- If m and n are integers and both are perfect squares, then mn is also a perfect square.
- Sum of two odd integers is even.
- Add option or Add "Other"

$\sim q$

$\sqrt{9x}$

$n = 2k$

$4(n)+5$

$4(2k)+5$

$8k+5$

$p \to q = \sim q \to \sim p$

p: 4n+5 is odd

q: n is odd

$3+3 = 6$

$p \to q$

$p \to q = \sim q \to \sim p$

P(0) is true.

① Direct Proof

n is odd → n^2 is odd

② 3n+2 is odd n is odd

Contrapositive proof

③ $\sqrt{2}, \sqrt{3}$, are irrational no.

Contradiction Proof.

④ P(0): If (F) then (F)

Vacuous Proof

$P(n)$: If $n > 1$ then $n^2 > n$.

$P(0)$: If $0 > 1$ then $0^2 > 0$

p	q	p→q
T	T	T
T	F	F
F	T	T

P(n): If n>1 then n>4.

P(0): $\boxed{\text{If}}$ 0>1 then $0^2>0$

F F

T	F	F
F	T	T
F	F	T

Vacuous Proof

(5) P(0): If T then T

Trival Proof

p: m and n are integers and both are perfect sq.

q: mn is perfect square.

$p \to q \equiv \sim q \to \sim p$

$\sim q$: n is even

$\sim p$: 4n+5 is even

$\sim q \to \sim p$

Which of t$\boxed{\text{he statement is not true?}}$

- Product of two natural numbers is a natural number. (T) $2 \cdot 3 = 6$
- Product of two irrational number is irrational. (F) $\sqrt{2} \times \sqrt{2} = 2$
- Product of two rational nunbers is a rational number. $\cancel{2} \times \frac{3}{\cancel{2}} = 3$
- Product of two real numbers is a real number.

The statement $p \wedge q$ is logically equivalent to

- $p \wedge \neg q$ ✗
- $\neg p \to q$ ✗
- $\boxed{\neg (p \to \neg q)}$ ✓
- $\neg (p \vee q)$ ✗

$\sim(\sim p) \vee q$

$\boxed{p \vee q}$

$\sim (\sim p \vee \sim q)$

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

$\boxed{p \wedge q}$

$p \to (q \vee r)$ is equivalent to

A. $(p \to q) \to (p \to r)$

B. $(p \to q) \vee (p \to r)$

C. $(p \to q) \wedge (p \to r)$

D. $(q \to p) \vee (p \to r)$

Which of the following statements is equivalent to "If $x = 3$, then $x^2 - 9 = 0$"?

A. If $x^2 - 9 = 0$, then $x = 3$
B. If $x \neq 3$, then $x^2 - 9 \neq 0$
C. If $x^2 - 9 \neq 0$, then $x \neq 3$
D. If $x^2 - 9 = 0$, then $x \neq 3$.

Find the equivalent statement of $\exists$ x P(x) {Existential quantification}, where Domain D = $\{x_1, x_2, x_3, \dots\dots, x_n\}$

A. $P(x_1) \wedge P(x_2) \wedge P(x_3) \wedge \dots \dots \wedge P(x_n)$

B. $P(x_1) \vee P(x_2) \vee P(x_3) \vee \dots \dots \vee P(x_n)$

C. $P(x_1) \rightarrow P(x_2) \rightarrow P(x_3) \rightarrow \cdots \dots \rightarrow P(x_n)$

D. $P(x_1) \leftrightarrow P(x_2) \leftrightarrow P(x_3) \leftrightarrow \cdots \dots \leftrightarrow P(x_n)$

~ (p ∧ q) ∨ (p ∨ q) is a

- Tautology
- Contradiction
- Contingency
- None of the above

. $p \leftrightarrow q$ is logically equivalent to

A. $(p \rightarrow q) \rightarrow (q \rightarrow p)$

B. $(p \rightarrow q) \vee (q \rightarrow p)$

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

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

Let Q(x) is the statement "x + 1 > 2x", where domain is the set of integers then identify the correct statement.

A. Q(0) has truth value = false

B. $\exists x\ Q(x)$ has truth value = false

C. $\forall x\ Q(x)$ has truth value = false

D. $Q(-1)$ has truth value = false