Tuesday, August 31, 2021 9:03 AM

Which of the following statement is not a proposition? *

- ○ 2+3=5 (T)
- ○ $\boxed{\text{May you live long!}}$ ✓
- ○ 2+2=4 (T)
- ○ The first odd prime number is 3. (T)

If p is any statement, then which of the following is a contradiction? *

- ○ $\boxed{p \wedge \neg p}$ ✓
- ○ $p \vee p$ X
- ○ $p \vee \neg p$ X
- ○ None of these X

p	$\sim p$	$p \wedge \sim p$	$p \vee p$	$p \vee \sim p$
T	F	F	T	T
F	T	F	F	T
			X	X

The contrapositive of $p \rightarrow q$ is: *

- $\neg p \rightarrow \neg q$
- $\boxed{\neg q \rightarrow \neg p}$ ✓
- $q \rightarrow p$
- $\neg q \rightarrow p$

$p \rightarrow q \equiv \boxed{\sim q \rightarrow \sim p}$

¬ (¬P →¬ Q) is equivalent to *

- ¬P∧ Q
- ¬q → ¬p
- q → p
- ¬q → p

$\boxed{p \to q = \sim p \vee q}$

$\sim(\sim p \to \sim q)$

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

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

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

$\boxed{\sim p \wedge q}$

Which of the following statement is not correct? *

- p ∨ q ≡ q ∨ p
- ¬(p ∧ q) ≡ ¬p ∨ ¬q
- (p ∨ q) ∧ r ≡ p ∨ (q ∨ r)
- All of these

$(p \vee q) \wedge r = (p \wedge r) \vee (q \wedge r)$ Distributive Law.

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

What is the negation of the statement “Sam is poor and happy”? *

- ◯ Sam is poor and unhappy.
- ◯ Either Sam is rich or unhappy
- ◯ Either Sam is poor or unhappy
- ◯ Sam is rich and happy.

Which of the following statement is false?

(a) If 1+1=2, then 2+2=5 (F)

(b) If 1+1=3, then 2+2=4 (T)

(c)If 1+1=3, then 2+2=5 (T)

(c) If pigs can fly, then 1+1=3 (T)

F F

p	q	p → q
T	T	T
T	F	F
F	T	T
F	F	T

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

(a) 4 (b) 8 (c) 16 (d) 32

a

Total no of rows = $2^{\text{no of proposition}}$

$= 2^3 = 8$

What is the negation of the statement $\boxed{\forall x(x^2 > x)}$

$\boxed{\text{(a) } \exists x(x^2 \leq x)}$

(b) $\exists x \sim (x^2 \leq x)$

(c) $\exists x \sim (x^2 < x)$

(d) $\exists x(x^2 < x)$

$\exists x\ (x^2 \leq x)$

When to proof P→Q true, we proof $\boxed{\text{P true}}$ and $\boxed{\text{Q is also true}}$ then, what type of proof is this? *

- $\boxed{\text{trivial proof}}$ ✓
- Contrapositive proof
- Vacuous proof
- Mathematical Induction

Which of the following statement is the negation of the statements "9 is odd or -11 is positive"?

and

- 9 is even and -11 is not negative
- 9 is even and -11 is negative
- 9 is odd and -9 is negative
- 9 is even or -11 is not negative

Which of the following theorem can be proved using direct proof?

- If n is an integer and 3n + 5 is odd, then n is odd. Contra positive
- If n is an odd integer, then n^3 is odd. Direct
- √7 is an irrational number X Contradiction
- √11 is an irrational number X Contradiction.

Let P (n) be the proposition "If 4>2, then (4)^n ≥ (2)^n" To show P (2) is true, what kind of proof is to be used?

- Direct proof
- Contradiction proof
- vacuous proof
- Trivial proof

$P(n)$: If $4>2$ then $(4)^n > (2)^n$.

$P(2)$: If $4>2$ then $(4)^2 > (2)^2$ "

$\boxed{P(2)}$: If $\underbrace{4>2}_{T}$ then $\underbrace{\boxed{16>4}}_{T}$

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

- $p \wedge \neg q$
- $\neg p \rightarrow q$
- $\neg(p \rightarrow \neg q)$
- $\boxed{\neg(p \vee q)}$

|A counterexample to the universally quantified statement $\forall x(x^2 < 3)$, where the domain consists of all real numbers, is

A. $x = 0$ —
B. $x = -1$
C. $x = 1$
D. $\boxed{x = -2}$ ✓

$0^2 < 3$ (T) ×
$(-1)^2 < 3$ (T) ×
$(1)^2 < 3$ (T) ×.

$(-2)^2 < 3$

$\boxed{4 < 3}$ ✓

p	q	$p \to q$
T	T	T
T	F	F
F	T	T
F	F	T

p	q	$p \leftrightarrow q$
T	T	T
T	F	F
F	T	F
F	F	T

Which of the following statements is FALSE?

A. If 1+1 = 3 if and only if Monkeys can fly F F (True)

B. If 0>1, then 2>1. F T (True)

T C. 2+2=4 if and only if 1+1=2 T → True

D. If 1+1=2, then 2+3 < 5 False.

T F

If R(x, y, z) denotes "$x^2 + y^2 = z^2$" then which of the following is correct?

(a) R(1, 2, 3) has truth value = true × $1^2+2^2=3^2 \Rightarrow 1+4=9 \Rightarrow 5=9$

(b) R(1, 0, 0) has truth value = true × $1^2+0^2=0^2 \Rightarrow \boxed{1=0}$

(c) R(0, 1, 0) has truth value = true × $0^2+1^2=0^2 \Rightarrow 1=0$ ×

(d) R(0, 0, 1) has truth value = false ✓

$0^2+0^2=1^2$

$\boxed{0=1}$ (false)

~ (p ∧ q) ∨ (~p ∨ ~q) is a

- Tautology
- Contradiction
- Contingency
- None of the above

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

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

$\boxed{\sim p \vee \sim q}$ Contingency

Let P: We should be honest., Q: We should be dedicated., R: We should be overconfident. Then 'We should be honest or dedicated but not overconfident.' is best represented by?

a) ~P V ~Q V R
b) P ∧ ~Q ∧ R
c) P V Q ∧ R
d) P V Q ∧ ~R

$\boxed{P \vee Q \wedge \sim R}$

If x and y are integers of opposite parity (one odd another even) the 5x+5y is

a) $\boxed{\text{Always Odd}}$
b) Always Even
c) Odd for some values and even for other values
d) Can not be decided

$x = 5, \quad y = 2$

$5(x+y) = 5(5+2)$

$= 5 \times 7 = 35$

$x = 3, \quad y = 2$

$5(x+y) = 5(3+2) = 5 \times 5 = 25$