Maths Survey

Author

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# Question No: 01

Write the statement in symbolic form:

P= the chilly is spicy

Q= the sour cream is cold

It is false that if the sour cream is not cold then the chilly is spicy

Symbolic form: **~q 🡪 p = false**

# Question No: 02

Write the statement in symbolic form

q= the temperature is 90 degree

p= the air conditioner is working

r= the apartment is working

If the air conditioner is working then the temperature is 90 degrees, if and only if the apartment is hot

Symbolic form: **q🡪p 🡨🡪r**

# Question No: 03

Write the statement in symbolic form and create the truth table

I am hungry, and I want to eat healthy lunch and I want to eat in hurry

Symbolic Form: **p ^ q ^ r**

Truth Table:

|  |  |  |  |
| --- | --- | --- | --- |
| p | q | r | **p ^ q ^ r** |
| T | T | T | T |
| F | T | T | F |
| T | F | T | F |
| F | F | T | F |
| T | T | F | F |
| F | T | F | F |
| T | F | F | F |
| F | F | F | F |

# Question No: 04

Determine the truth value of the statement if p is true, q is false, and r is true

~p ^ (~q v ~r)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| p | q | r  | ~p | ~q | ~r |  (~q v ~r) | ~p ^ (~q v ~r) |
| T | F | T | F | T | F | T | F |

# Question No: 05

Construct a truth table for

(p ^q) 🡪 (q v r)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| p | q | r | **p ^ r** | q v r | (p ^q) 🡪 (q v r) |
| T | T | T | T | T | T |
| F | T | T | F | T | F |
| T | F | T | T | T | T |
| F | F | T | F | T | F |
| T | T | F | T | T | F |
| F | T | F | F | T | F |
| T | F | F | F | F | T |
| F | F | F | F | F | T |

# Question No: 06

If p is true, q is false, and r is true then truth value of the statement

r 🡪 (~p🡨🡪~q)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| p | q | r  | ~p | ~q | ~r |  ~p🡨🡪~q | r 🡪 (~p🡨🡪~q)  |
| T | F | F | F | T | T | F | T |

# Question No: 07

If Joanne goes to sabre games, then she will not got to Bill games.

If Joanne goes to sabre games = p

She will not go to Bill games = ~q

p🡪~q

Equivalent form:

If Joanne will not go to Bill games = ~p

She will go to sabre games = q

~p ^ q

# Question No: 08

Write the contrapositive of the statement

If the quadrilateral is a parallelogram then the opposite sides are parallel

Quadrilateral is a parallelogram = p = true

Opposite sides are parallel = q = true

p 🡪 q

Contrapositive:

If the quadrilateral is not a parallelogram then the opposite sides are not parallel

Quadrilateral is a not parallelogram = ~p = true

Opposite sides are not parallel = ~q = true

~p🡪~q

# Question No: 09

You solve the NewYork Time crosswords puzzle= p

You are genius= q

If you solve the New York Times crossword puzzle then you are genius = p🡪q

You are not genius = ~q

Therefore, you did not solve the New York Times cross word puzzle = ~p

Symbolic form:

((p🡪q) ^ ~q)🡪 ~p

Truth Table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| p | q | ~p | ~q | p🡪q | ((p🡪q) ^ ~q) | ((p🡪q) ^ ~q)🡪 ~p |
| T | T | F | F | T | F | T |
| T | F | F | T | F | F | T |
| F | T | T | F | F | F | F |
| F | F | T | T | T | T | T |

**The argument is invalid**

# Question No: 10

Engineering courses are difficult= p

Chemistry labs are long= q

Arts test are easy =r

The engineering courses are difficult and chemistry labs are long = p ^q

If chemistry tests are long then arts tests are easy = p🡪r

Therefore, the engineering courses are difficult and arts tests are not easy = p ^ ~r

Symbolic form:

((P ^ q) ^ p🡪q) 🡪 p ^ ~r

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| p | q | r | ~p | ~q | ~r | p ^q | p🡪r | p ^ ~r | ((P ^ q) ^ p🡪q) 🡪 p ^ ~r |
| T | T | T | F | F | F | T | T | F | F |
| T | T | F | F | F | T | T | F | T | F |
| T | F | T | F | T | F | F | T | F | F |
| T | F | F | F | T | T | F | F | T | F |
| F | T | T | T | F | F | F | F | F | F |
| F | T | F | T | F | T | F | T | F | F |
| F | F | T | T | T | F | F | F | F | F |
| F | F | F | T | T | T | F | T | F | F |

**The argument is not valid**