PRINTABLE VERSION

Quiz 2

You scored 100 out of 100

Question 1

Your answer is CORRECT.

After a statement P has been negated 8 times, the resulting statement is logically equivalent to

a) ◉ P

b) ○ $P \wedge \neg P$

c) ○ $\neg P$

d) ○ $P \vee \neg P$

e) ○ None of the above.

Question 2

Your answer is CORRECT.

$\neg Q \Rightarrow \neg P$ is logically equivalent to which, if any, of the following statements? (Hint: a truth table should help!)

a) ◉ $P \Rightarrow Q$

b) ○ $\neg Q \wedge \neg P$

c) ○ $\neg P \wedge Q$

d) ○ $Q \Rightarrow P$

e) ○ $\neg P \Rightarrow \neg Q$

Question 3

Your answer is CORRECT.

De Morgan's Laws tells us that $\neg (P \wedge \neg Q)$ is logically equivalent to which of the following statements?

a) ○ $P \vee Q$

b) $P \wedge Q$

c) $\neg P \wedge Q$

d) $\neg P \vee Q$

e) $\neg Q \wedge \neg P$

Question 4

Your answer is CORRECT.

The symbol " $\forall$ " means ...

a) "There exists" or "Some "

b) "There does not exist"

c) "Not all" or "Not every"

d) "For all" or "For every"

e) "There exists exactly one" or "There exists a unique"

Question 5

Your answer is CORRECT.

Determine which of the following statements is true when using the universal set $U = Z$.

a) $\forall x, \quad x^3 - 4x \neq 0$

b) $\forall x, \quad x^3 - 4x = 0$

c) $\exists x, \; x^2 \leq -1,$ but not every x satisfies this condition.

d) $\exists ! x, \; x^3 - 4x = 0$

e) $\exists x, \; x^3 - 4x = 0,$ but not every x satisfies this condition.

Question 6

Your answer is CORRECT.

Consider the English sentence:

When some pairs of integers are added together the result is not positive

Which of the following statements correctly expresses this sentences using logical symbols?

a) $\exists\, x, y \in Z,\ xy \in Z$

b) $\exists\, x, y \in Z,\ x + y \in Z$

c) $\forall\, x, y \in Z,\ \ x + y \in Z$

d) $\forall\, x, y \in Z,\ \ x + y \leq 0$

e) $\exists\, x, y \in Z,\ x + y \leq 0$

f) $\forall\, x, y \in Z,\ \ xy \in Z$

Question 7

Your answer is CORRECT.

Consider the following statement:

$$\exists\, x,\ \forall\, y,\ x + y = y.$$

From the options provided below, which universal set U makes this statement true?

a) $U = \{-9, -6, -3, 0, 3, 6, 9\}$

b) $U = \{2, 4, 6, 8, \ldots\}$

c) $U = \{5\}$

d) $U = \{1/2, 1, 2\}$

e) $U = \{-1, 3\}$

Question 8

Your answer is CORRECT.

Consider the English sentence P : " Someone is wearing a blue shirt." The negation of P can be expressed in logical symbols as which of the following? (We are using $U = \{$ all people $\}$ as our universal set.)

a) $\neg P : \forall\, x,\ x$ is not wearing a blue shirt

b) $\neg P : \exists\, x,\ x$ is not wearing a blue shirt

c) $\neg P : \exists\, x,\ x$ is wearing a blue shirt

d) $\neg P : \forall\, x,\ x$ is wearing a blue shirt