# PRINTABLE VERSION

## Quiz 3

## You scored 50 out of 100

**Question 1**

Your answer is CORRECT.

Suppose we are told that set $A$ satisfies $\{1, \pi, \clubsuit\} \cap A = \{1\}$. Of the following options which can be used for the set $A$?

**a)** ○ $\{\pi, 2\}$

**b)** ○ $\{\heartsuit\}$

**c)** ○ No set $A$ will make this true.

**d)** ◉ $Z$

**e)** ○ $\{-1, \clubsuit, \heartsuit\}$

**f)** ○ $\{1, \pi, \clubsuit\}$

**Question 2**

Your answer is INCORRECT.

The statement $A \cap B \neq \emptyset$ implies which of the following?

**a)** ○ $\forall x \in B, x \in A$.

**b)** ○ $\forall x \in A, x \in B$.

**c)** ◉ $\exists x, x \in A \wedge x \in B$.

**d)** ○ $A = \emptyset \wedge B = \emptyset$

**Question 3**

Your answer is CORRECT.

Suppose $|S| = 5$ and $|S \times T| = 30$. What is the cardinality of $T$?

**a)** ⦿ $|T| = 6$

**b)** ◯ $|T| = 150$

**c)** ◯ $|T| = 11$

**d)** ◯ $|T| = 30$

**e)** ◯ $|T| = 1$

## Question 4

Your answer is CORRECT.

Suppose $|T| = 5$ and $|P(S) \times T| = 20.$ What is the cardinality of $S$ ?

**a)** ◯ $|S| = 20$

**b)** ◯ $|T| = 5$

**c)** ◯ $|S| = 2^5$

**d)** ◯ $|S| = 4$

**e)** ⦿ $|S| = 2$

## Question 5

Your answer is CORRECT.

Is it possible for $|S \cup T| < |T|$?

**a)** ◯ This can happen, but it doesn't always happen.

**b)** ⦿ This is impossible! It never happens!

**c)** ◯ This is true. It always happens!

## Question 6

Your answer is INCORRECT.

Consider the set $S$ defined below:
$$S = \{n \in N : 2^{-a} \cdot n = 1 \text{ for some } a \in N\}$$
Which of the following is true?

**a)** ○ $S = \{2i + 1 : i \in N\}$

**b)** ○ $S = \{2^b : b \in N\}$

**c)** ◉ $S = N$

**d)** ○ $S = \{2m : m \in N\}$

**e)** ○ $S = \emptyset$

**Question 7**

Your answer is INCORRECT.

Suppose we have two sets $S$ and $T$, each described in terms of a condition: $S = \{x \in U : P(x)\}$ and $T = \{x \in U : Q(x)\}$ . (Here $U$ is a Universal set.) If it is also true that
$$S \cap T \neq \emptyset$$
then which of the following statements must be true?

**a)** ○ $\forall x \in U, \; P(x) \Rightarrow Q(x)$

**b)** ◉ $\forall x \in U, \; P(x) \nRightarrow Q(x)$

**c)** ○ $\forall x \in U, \; Q(x) \nRightarrow P(x)$

**d)** ○ $\exists t \in U, P(t) \wedge Q(t)$

**e)** ○ $\forall x \in U, \; Q(x) \Rightarrow P(x)$

**Question 8**

Your answer is INCORRECT.

A Venn Diagram or De Morgan's Laws should help you complete this sentence:
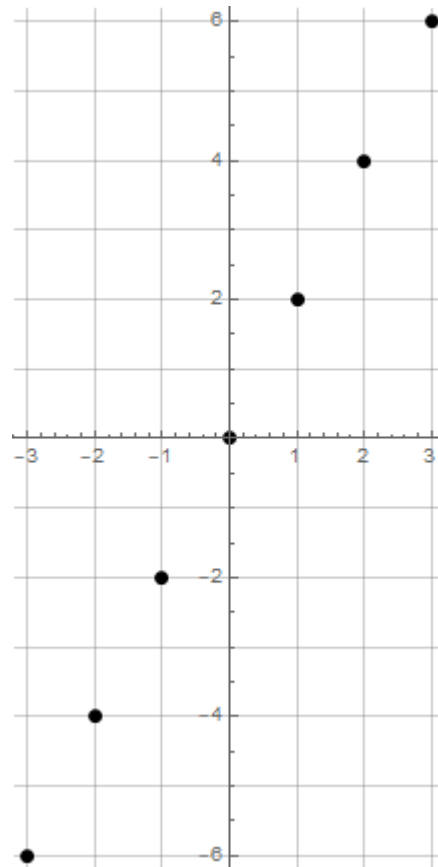$$\overline{B - A} \; = $$

**a)** ○ $A \cup \overline{B}$

**b)** ○ $\overline{A} \cup B$

**c)** ○ $B \cup \overline{A}$

**d)** ○ $\overline{A} \cup \overline{B}$

**e)** ◉ $\overline{A} \cap \overline{B}$

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**Question 9**

Your answer is CORRECT.

Consider the image shown:



Which set of points is depicted in the image above?

**a)** ○ $\{(x, x^2) : x \in Z \wedge -3 \leq x \leq 3\}$

**b)** ◉ $\{(x, 2x) : x \in Z \wedge -3 \leq x \leq 3\}$

**c)** ○ $\{(x, 2) : x \in Z \wedge -3 \leq x \leq 3\}$

**d)** ○ $\{(2, x) : x \in Z \wedge -3 \leq x \leq 3\}$

**e)** ○ $\{(x, \sin(\pi x)) : x \in Z \wedge -3 \leq x \leq 3\}$

**f)** ○ $\{(x, \sqrt{9 - x^2}) : x \in Z \wedge -3 \leq x \leq 3\}$

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**Question 10**

Your answer is INCORRECT.

$P(\{1, 8\}) \cap P(\{1, 100, 8\}) =$

**a)** ○ { {100} }

**b)** ○ {1, 8, 100}

**c)** ○ { {8}, {1, 8} }

**d)** ○ { {8} }

**e)** ○ { ∅, {1}, {8}, {1, 8} }

**f)** ◉ {1, 8}