

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) ☐ No set A will make this true.
- b) ☐ $\{1, \pi, \clubsuit\}$
- c) ☒ \mathbb{Z}
- d) ☐ $\{\heartsuit\}$
- e) ☐ $\{-1, \clubsuit, \heartsuit\}$
- f) ☐ $\{\pi, 2\}$

Question 2

Your answer is CORRECT.

The statement $A \subseteq B$ implies which of the following?

- a) ☐ $\forall x \in B, x \in A$.
- b) ☐ $\exists x, x \in A \wedge x \in B$.
- c) ☒ $\forall x \in A, x \in B$.
- d) ☐ $A = \emptyset \wedge B = \emptyset$

Question 3

Your answer is CORRECT.

Suppose $|S| = 7$ and $|S \times T| = 14$. What is the cardinality of T ?

- a) ☐ $|T| = 9$
- b) ☒ $|T| = 2$
- c) ☐ $|T| = 98$
- d) ☐ $|T| = 5$
- e) ☐ $|T| = 14$

Question 4

Your answer is INCORRECT.

Suppose $|T| = 5$ and $|P(S) \times T| = 40$. What is the cardinality of S ?

- a) ☐ $|S| = 40$
- b) ☒ $|S| = 2^5$
- c) ☐ $|S| = 8$
- d) ☐ $|T| = 5$
- e) ☐ $|S| = 3$

Question 5

Your answer is INCORRECT.

Is it possible for $(1, 3) \in \mathbb{N}$?

- a) ☐ This can happen, but it doesn't always happen.
- b) ☒ This is true. It always happens!
- c) ☐ This is impossible! It never happens!

Question 6

Your answer is INCORRECT.

Consider the set S defined below:

$$S = \{n \in \mathbb{N} : n^2 \in \mathbb{N}\}$$

Which of the following is true?

- a) ☐ $S = \mathbb{N}$
- b) ☐ $S = \emptyset$
- c) ☐ $S = \{2^b : b \in \mathbb{N}\}$
- d) ☐ $S = \{2i + 1 : i \in \mathbb{N}\}$
- e) ☒ $S = \{2m : m \in \mathbb{N}\}$

Question 7

Your answer is CORRECT.

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

$$S \not\subseteq T$$

then which of the following statements must be true?

- a) ☒ $\forall x \in U, P(x) \not\Rightarrow Q(x)$
- b) ☐ $\exists t \in U, P(t) \wedge Q(t)$
- c) ☐ $\forall x \in U, Q(x) \Rightarrow P(x)$
- d) ☐ $\forall x \in U, P(x) \Rightarrow Q(x)$
- e) ☐ $\forall x \in U, Q(x) \not\Rightarrow P(x)$

Question 8

Your answer is INCORRECT.

A Venn Diagram or De Morgan's Laws should help you complete this sentence:

$$\overline{A - B} =$$

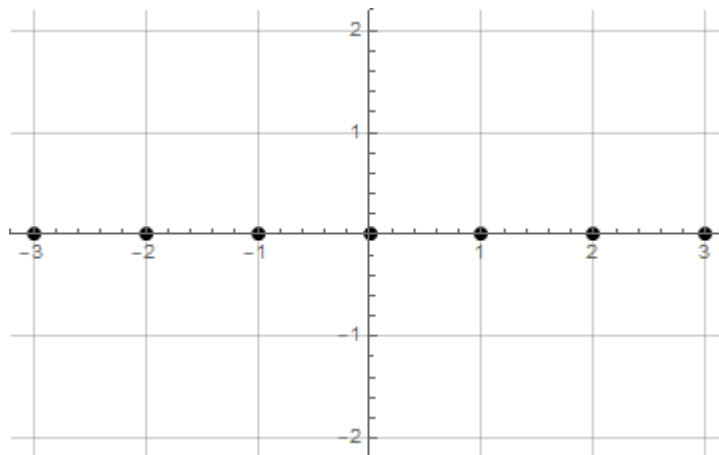
- a) ☐ $\overline{A} \cap \overline{B}$
- b) ☐ $A \cup \overline{B}$
- c) ☒ $\overline{A} \cup \overline{B}$
- d) ☐ $B \cup \overline{A}$

e) ☐ $\overline{A} \cup B$

Question 9

Your answer is CORRECT.

Consider the image shown:



Which set of points is depicted in the image above?

- a) ☐ $\{(x, 2) : x \in \mathbb{Z} \wedge -3 \leq x \leq 3\}$
- b) ☐ $\{(x, x^2) : x \in \mathbb{Z} \wedge -3 \leq x \leq 3\}$
- c) ☒ $\{(x, \sin(\pi x)) : x \in \mathbb{Z} \wedge -3 \leq x \leq 3\}$
- d) ☐ $\{(x, 2x) : x \in \mathbb{Z} \wedge -3 \leq x \leq 3\}$
- e) ☐ $\{(x, \sqrt{9 - x^2}) : x \in \mathbb{Z} \wedge -3 \leq x \leq 3\}$
- f) ☐ $\{(2, x) : x \in \mathbb{Z} \wedge -3 \leq x \leq 3\}$

Question 10

Your answer is INCORRECT.

$$P(\{3, 4\}) \cap P(\{3, -3, 4\}) =$$

- a) ☐ $\{\emptyset, \{3\}, \{4\}, \{3, 4\}\}$
- b) ☐ $\{\{4\}, \{3, 4\}\}$
- c) ☐ $\{3, 4, -3\}$

d) ☐ $\{ \{4\} \}$

e) ☐ $\{ \{-3\} \}$

f) ☒ $\{3, 4\}$