

PRINTABLE VERSION

Quiz 3

You scored 60 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) ☐ $\{1, \pi, \clubsuit\}$
- b) ☐ $\{\pi, 2\}$
- c) ☐ No set A will make this true.
- d) ☐ $\{-1, \clubsuit, \heartsuit\}$
- e) ☒ \mathbb{Z}
- f) ☐ $\{\heartsuit\}$

Question 2

Your answer is INCORRECT.

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

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

Question 3

Your answer is CORRECT.

Suppose $|S| = 3$ and $|S \times T| = 6$. What is the cardinality of T ?

- a) ☐ $|T| = 6$
- b) ☐ $|T| = 5$
- c) ☐ $|T| = 18$
- d) ☐ $|T| = 1$
- e) ☒ $|T| = 2$

Question 4

Your answer is INCORRECT.

Suppose $|T| = 4$ and $|P(S) \times T| = 16$. What is the cardinality of S ?

- a) ☒ $|S| = 2^4$
- b) ☐ $|S| = 16$
- c) ☐ $|S| = 4$
- d) ☐ $|S| = 2$
- e) ☐ $|T| = 4$

Question 5

Your answer is CORRECT.

Is it possible for $\{5\} \subseteq \mathbb{R}$?

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

Question 6

Your answer is CORRECT.

Consider the set S defined below:

$$S = \{n \in \mathbb{N} : 2n = 1 \vee 3n = 1\}$$

Which of the following is true?

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

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

$$T \subseteq S$$

then which of the following statements must be true?

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

Question 8

Your answer is INCORRECT.

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

$$A - B =$$

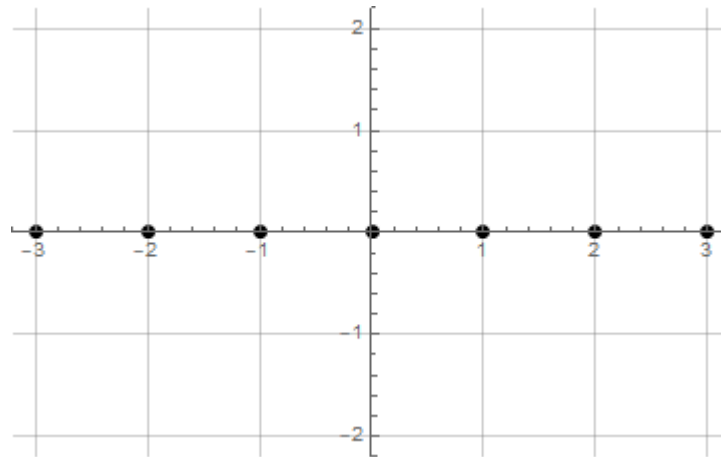
- a) ☐ $\overline{A} \cap \overline{B}$
- b) ☒ $A \cup \overline{B}$
- c) ☐ $B \cup \overline{A}$
- d) ☐ $\overline{A} \cup B$

e) ☐ $\overline{A} \cup \overline{B}$

Question 9

Your answer is CORRECT.

Consider the image shown:



Which set of points is depicted in the image above?

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

Question 10

Your answer is INCORRECT.

$$P(\{1, 8\}) \cap P(\{1, -2, 8\}) =$$

- a) ☐ $\{\{8\}\}$
- b) ☐ $\{1, 8, -2\}$
- c) ☒ $\{1, 8\}$

d) ☐ $\{ \emptyset, \{1\}, \{8\}, \{1, 8\} \}$

e) ☐ $\{ \{8\}, \{1, 8\} \}$

f) ☐ $\{ \{-2\} \}$