

Lecture 1 - Practice Questions

1. Let $f : \mathbb{Z} \rightarrow \mathbb{Z}$ such that $f(x) = x^2$. Which of the following statements is not true?
 - A. $f(-1) = -1$
 - B. $f(1) = 1$
 - C. $f(0) = 0$
 - D. $f(2) = 4$
2. Which of the following is not a function with domain \mathbb{Z} and codomain \mathbb{R} ?
 - A. $f(x) = \pm x$
 - B. $f(x) = \sqrt{x^2}$
 - C. $f(x) = x$
 - D. $f(x) = \ln(x^2 + 1)$
3. Consider the function $f : \mathbb{N} \rightarrow \mathbb{Z}$ such that $f(x) = x - 100$. What is the codomain of f ?
 - A. \mathbb{N}
 - B. \mathbb{Z}
 - C. \mathbb{Z}_+
 - D. \mathbb{R}
4. Consider the function $f : \mathbb{R} \rightarrow \mathbb{R}$ such that $f(x) = x^2$. What is the image of -1 ?
 - A. -1
 - B. 1
 - C. 2
 - D. \mathbb{R}
5. Let $f : \{-2, -1, 0\} \rightarrow \mathbb{Z}$ such that $f(x) = x^2$. What is the image of f ?
 - A. $\{-2, -1, 0\}$
 - B. $\{0, 1, 2\}$
 - C. \mathbb{Z}
 - D. None of the others
6. Which of the following functions $f : \mathbb{R}_+ \rightarrow \mathbb{R}_+$ is not invertible?
 - A. $f(x) = x$
 - B. $f(x) = x^2$
 - C. $f(x) = x^3$
 - D. None of the others
7. Let $f : \mathbb{R} \rightarrow \mathbb{R}$, $f(x) = x^3$. What is $f^{-1}(-1)$?
 - A. -3

- B. -1
C. 1
D. 3
8. Consider the function $f : \mathbb{R}_+ \rightarrow \mathbb{R}_+$, $f(x) = x^2$. Which of the following statements is correct?
- It is both injective and surjective
 - It is injective but not surjective
 - It is surjective but not injective
 - It is neither injective nor surjective
9. Which of the following functions $f : \mathbb{R} \rightarrow \mathbb{R}$ is not surjective?
- $f(x) = 2x$
 - $f(x) = -3x + 4$
 - $f(x) = x^3 + 1$
 - $f(x) = x^2 - 3$
10. A function $f : X \rightarrow Y$ is given by the graph below. Which of the following statements is correct?
-
- A. The function is injective and surjective
B. The function is injective but not surjective
C. The function is surjective but not injective
D. The function is neither injective nor surjective
11. Let f be functions with domain $\{a, b, c\}$ and codomain $\{0, 1, 2\}$. Which of the following functions is bijective?
- $f(a) = f(b) = f(c) = 1$
 - $f(a) = 0, f(b) = 1, f(c) = 2$
 - $f(a) = 2, f(b) = 1, f(c) = 2$
 - $f(a) = f(b) = f(c) = 2$
12. Let $f : \{a, b\} \rightarrow \{0, 1, 2, 3\}$ such that $f(a) = 0, f(b) = 3$. Which of the following statements is correct?
- The function is neither injective nor surjective
 - The function is injective but not surjective
 - The function is surjective but not injective
 - The function is both injective and surjective

Question	Correct Answer
1	A
2	A
3	B
4	B
5	D
6	D
7	B
8	A
9	D
10	D
11	B
12	B