

Unit 1 Test

Notation, Domain & Range, Composition, Transformations & Inverses

Name: _____ Date: _____ Score: ____ / 10

INSTRUCTIONS

For multiple-choice questions, circle the letter of the correct answer. For short-answer and problem-solving questions, show your complete work in the space provided. No calculator unless your teacher says otherwise.

1 If $f(x) = 2x^2 - 3x + 1$, find $f(-2)$.

Multiple Choice

A 15**B** 11**C** 3**D** 23**2** Find the domain of $f(x) = \sqrt{x - 3}$.

Multiple Choice

A $x \geq 3$ **B** $x > 3$ **C** $x \leq 3$ **D** All real numbers**3** Find the domain of $g(x) = 1/(x^2 - 9)$.

Multiple Choice

A All real numbers except $x = 3$ and $x = -3$ **B** All real numbers except $x = 9$ **C** $x \geq 9$ **D** All real numbers**4** Short Answer — If $f(x) = x^2 + 1$ and $g(x) = 2x - 3$, find $(f \circ g)(x)$.

Short Answer

5 If $f(x) = 3x - 5$, find $f^{-1}(x)$.

Multiple Choice

A $f^{-1}(x) = (x + 5)/3$ **B** $f^{-1}(x) = (x - 5)/3$ **C** $f^{-1}(x) = 3x + 5$ **D** $f^{-1}(x) = 3(x + 5)$ **6** The graph of $f(x) = x^2$ is transformed to $g(x) = (x - 3)^2 + 4$. Which describes the transformation?

Multiple Choice

A Shift right 3, up 4**B** Shift left 3, up 4**C** Shift right 3, down 4**D** Shift left 3, down 4

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Short Answer — Find the average rate of change of $f(x) = x^2 - 2x$ on the interval $[1, 4]$.

Short Answer

8

Which function is even?

Multiple Choice

A

$f(x) = x^2$

B

$f(x) = x^3$

C

$f(x) = x^2 + x$

D

$f(x) = |x| + x$

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Problem Solving — Given $f(x) = \sqrt{x+2}$ and $g(x) = x^2 - 1$, find $(g \circ f)(7)$ and $(f \circ g)(7)$. Show all steps.

Problem Solving

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Problem Solving — A function f has domain $[-3, 5]$ and range $[-2, 10]$. If $g(x) = f(x - 2) + 3$, find the domain and range of g .

Problem Solving