

PreAP Precalculus

TEST Chapter 2.1-2.5, Form A. No Calculator

Part I: Multiple Choice

Put your CAPITAL LETTER answer choice in the blank to the left of the number.

- _____ 1. Find the range of $f(x) = 5 - 4e^{2+3x}$
(A) $[5, \infty)$ (B) $(5, \infty)$ (C) $(-\infty, 5)$ (D) $(-\infty, 5]$ (E) all real numbers
- _____ 2. If $f(x) = \frac{-7}{3x+3}$ and $g(x) = \sqrt{x+1}$, what is the domain of $h(x) = (f \circ g)(x)$?
(A) $(-\infty, -1)$ (B) $(-1, \infty)$ (C) $(-\infty, -1) \cup (-1, \infty)$ (D) $[-1, \infty)$ (E) all real numbers
- _____ 3. If $f(x) = 2\ln(2-x) - 1$, the interval over which $f(x)$ is decreasing is
(A) $(-\infty, 2]$ (B) $(2, \infty)$ (C) $(-\infty, 2)$ (D) $(-\infty, -1)$ (E) all real numbers
- _____ 4. If $f(x) = -2e^x + 1$, what is the range of $g(x) = f(|x|)$?
(A) $(-\infty, -1]$ (B) $[1, \infty)$ (C) $(1, \infty)$ (D) $(-\infty, -1)$ (E) all real numbers
- _____ 5. If $g(x) = \frac{11-3x}{4x-5}$, then the domain of $g^{-1}(x)$ is
(A) $(-\infty, -\frac{3}{4}) \cup (-\frac{3}{4}, \infty)$ (B) $(-\infty, \frac{5}{4}) \cup (\frac{5}{4}, \infty)$ (C) $(-\infty, \frac{3}{11}) \cup (\frac{3}{11}, \infty)$ (D) $(-\infty, \frac{11}{4}) \cup (\frac{11}{4}, \infty)$
- _____ 6. If $h(x) = 2 + \ln(4x-1)$, find two functions, f and g , such that $h(x) = f(g(x))$.
(A) $f(x) = 4x-1$, $g(x) = 2 + \ln x$ (B) $f(x) = \ln(4x-1)$, $g(x) = 2+x$
(C) $f(x) = 2 + \ln(4x)$, $g(x) = x-1$ (D) $f(x) = 2 + \ln x$, $g(x) = 4x-1$ (E) $f(x) = 2 + \ln(4x-1)$, $g(x) = e^x$
- _____ 7. Determine if $f(x) = \frac{2\sqrt[3]{x}}{4\sqrt{x^2+1}}$ is Even, Odd, or Neither.
(A) Even (B) Odd (C) Neither (D) None of these (E) All of these
- _____ 8. In the function $g(x) = \frac{5}{x}$, the 5 vertically stretches the graph of $f(x) = \frac{1}{x}$ by a factor of 5. This is equivalent to what other transformation on f to produce the graph of g ?
(A) Horizontal compression bfo 5 (B) Horizontal compression bfo $\frac{1}{5}$ (C) Horizontal stretch bfo 5
(D) Horizontal stretch bfo $\frac{1}{5}$ (E) Vertical shift up 5 units

Part II: Free Response

Show all work BELOW THE LINE. No credit will be given for any work done above the line. Label each part, use proper notation, and box your final answers. Remember that on this section, your PROCESS is as important as your PRODUCT. BE SURE TO NAME EACH OF YOUR FUNCTIONS.

9. Given the following functions, answer the following questions.

$$f(x) = x^2 - 1 \quad g(x) = 2\sqrt{3-x} \quad m(x) = \frac{-5}{x} \quad n(x) = 3 - 4x \quad p(x) = 4 + 2x$$

(a) Find $h(x) = g(n(x))$, find the domain, then simplify.

(b) Find $h(x) = f(g(x))$, find the domain, then simplify.

(c) Find $h(x) = m(m(x))$, find the domain, then simplify.

(d) Find $h(x) = \frac{g(x)}{(n \circ p)(x)}$, then find the domain, then simplify.

10. For $f(x) = \frac{4}{3} - \frac{2}{5} \ln\left(1 + \frac{3}{8}x\right)$

- (a) Write $f(x)$ in standard transformation form.
 - (b) Find the **simplified, exact value** of the of the y -intercept. Show the work that leads to your answer.
 - (c) Sketch $f(x)$ showing the basic shape, y -intercept, and any/all asymptotes.
 - (d) Find D_f :
 - (e) Find R_f :
 - (f) Find the **Equation(s)** of any/all asymptotes. Be sure to label which type they are.
 - (g) Find $\lim_{x \rightarrow \infty} f(x)$
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